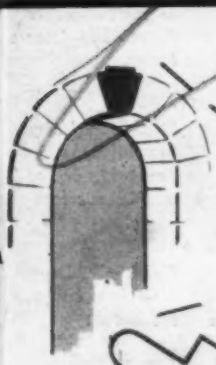
Industrial FINISHING

NOV 28 1947
DETROIT



For centuries the KEYSTONE has been an important "key" in building operations . . . . .

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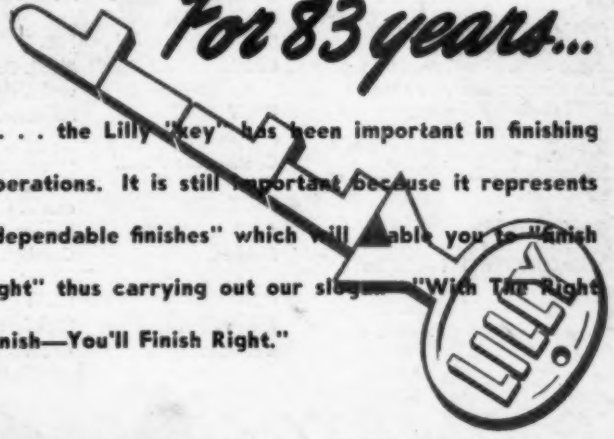
. . . . the Lilly "key" has been important in finishing operations. It is still important because it represents "dependable finishes" which will enable you to "finish right" thus carrying out our slogan—"With The Right Finish—You'll Finish Right."



The KEY *to the* RIGHT FINISH!

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THE LILLY COMPANY, HIGH POINT, N. C.

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Nov. 1947 - Oct. 1948

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"an Interchem Finish

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- **FIRST** *Organic Finish for Automobile License Plates.*
- **FIRST** *Finish Designed Specifically for Infra-Red Baking.*
- **FIRST** *Steel Drum Linings Permitting the Packaging of Foods and Chemicals.*
- **FIRST** *Permanent, Non-Grain-Raising Stains*
- **FIRST** *Flexible Air Dry No-Primer Lacquer for Metals.*
- **FIRST** *Grain Reproduction Finishes to Achieve Real 3-Dimensional Effects.*
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- **FIRST** *Modern Plastic Type Coatings for Wood.*
- **FIRST** *Commercially Successful Chlorinated Rubber Base Coatings.*
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- **FIRST** *Fungus-Resistant Coatings.*

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Interchem Finishes

Tech

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. . . Safe in the Plating Room . . .

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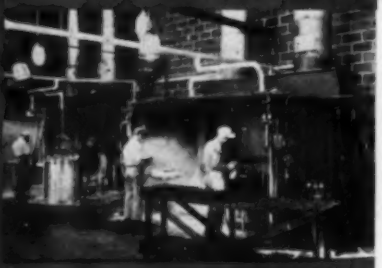
10 ... PLATERS

1. Not irritating to throats or hands.
2. Leaves no objectionable odor.
3. Outlasts simple solvents.
4. Not contaminated by oil, grease or buffing compounds.
5. Self-dispersing and quick rinsing.
6. Does not contaminate ALKALI cleaners.
7. Safe for ALL metals.
8. Removes oil, grease, dirt and pigmented drawing compounds from crevices.
9. Speeds the cleaning of steel and replaces alkali cleaning for phosphate treatments.
10. Operates at room temperature 70-90 F.

ENTHONE INC.



A Complete S

Air Cleaning Guns

Barrel Circulating Pumps

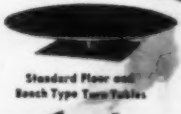
Pressure Feed Paint Tanks

Spray Gu

Hot Lacquer Units

Air and Material Regulators

Standard Bench Type Dry Spray Booths



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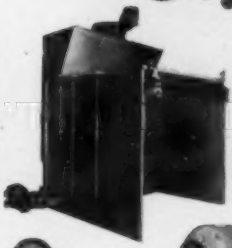
Spray Guns



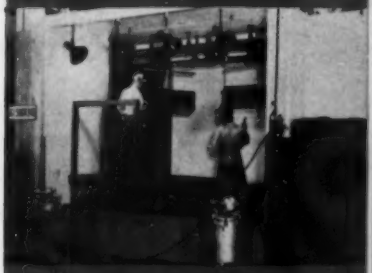
Water Wash Spray Booths

Large Water Wash Booth For Spraying Bus and Semi-Trailer Bodies.

Heavy Conveyor Type Water Wash Booth For Heavy Machine Tool Parts Painting.

Oil and Water Extractors

Exhaust Units for Spray Booths and Hazardous Locations



High Type Water Wash Booth For Refrigerator Parts Painting.

Air, Material Hose and Hose Connections

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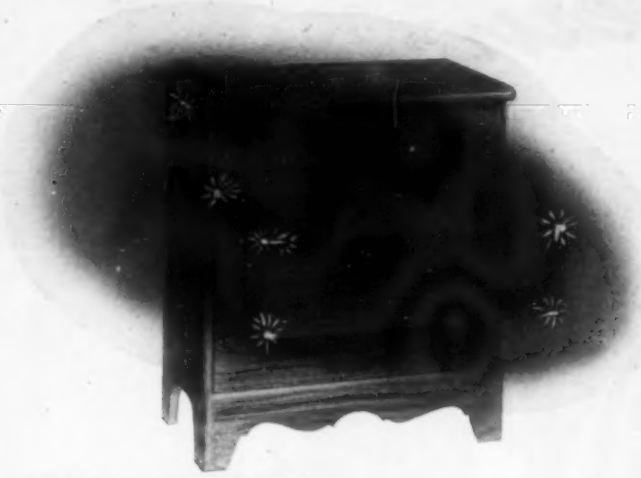

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Industrial FINISHING

W. H. ROHR, Editor P. C. BARDIN, Associate Editor

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Vol. XXIV, No. 1

★

Distributed monthly to finishing room and paint shop foremen, production superintendents, chemists, purchasing agents and company executives of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

★

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"HOLLOW AIR"
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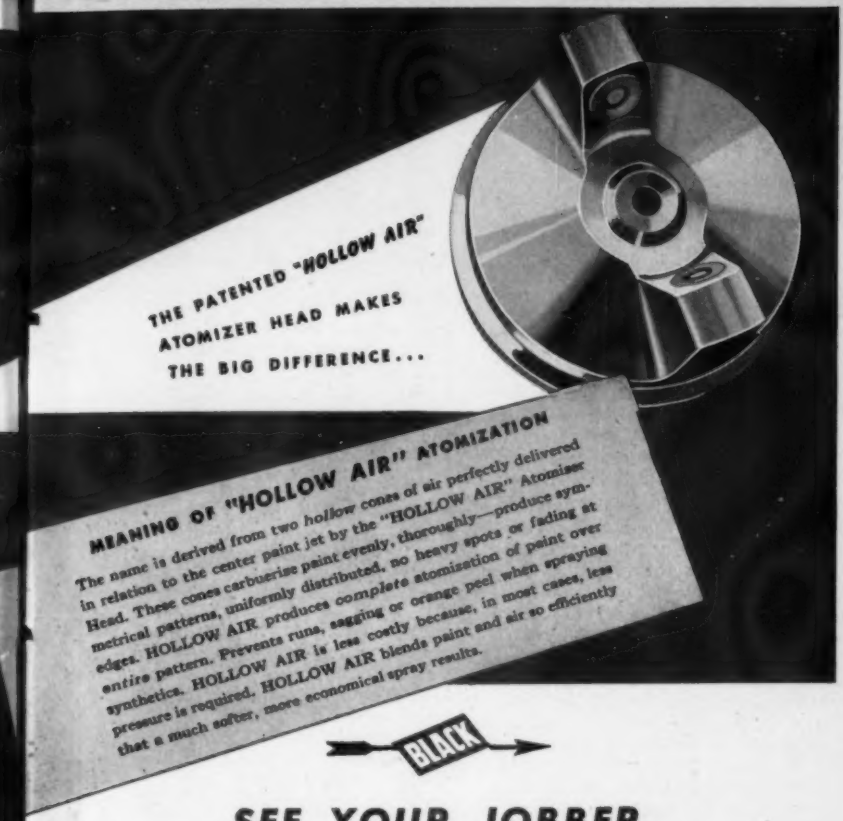
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Company Costs. Employes must understand the "economic facts of life" and the controller of a company is the best source of these facts, William W. Miller, industrial relations director of Stewart-Warner Corp, told members of the Controllers Institute of America meeting last month at the Drake hotel in Chicago.

"They must realize that improved machinery, better methods, increased efficiency and every other method of reducing manufacturing cost provide more jobs, better jobs and more secure jobs for the workers in the plant," he said.

The controller has the figures and should know how the facts can be presented graphically and in a way that can be easily understood, Miller stated. The controller is most qualified to provide the facts that will get "every employe, as well as the union representing the employes, to realize the interests of the company and of the employes are the same," he said.

* * *

Stainless-Clad Steel. Automobile bumpers made from Jessop stainless-clad steel will soon appear on the 1948 models of cars and trucks manufactured by two of the largest automobile companies, according to a recent announcement. Orders for large tonnages of stainless-clad steel have already been placed.

Jessop stainless-clad steel is made by a patented process, and consists of a layer of stainless steel permanently bonded to a mild steel backing. The stainless surface will take a high lustrous finish which successfully resists pitting, rusting and flaking over a long period of time. The mild steel backing provides mechanical strength and permits easy fabrication.

* * *

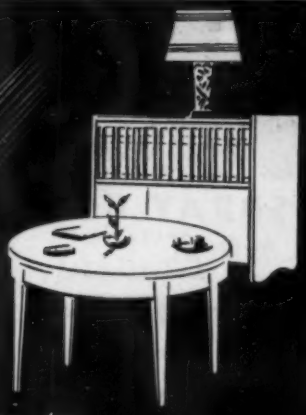
Buy What You Need. An important industrial executive cautioned members of an association of purchasing agents recently to watch their inventories and buy cautiously.

"My advice is to buy what you need—for delivery when you need it. Don't overbuy and don't hoard," he said. The continuing increase in food prices with resultant general price and wage increases, but without increased prodction is an unhealthy condition, he pointed out.

While anticipating a decline in prices and stating "the healthiest condition which could occur would be an exceedingly heavy crop in 1948 and lower prices," he expressed doubt there would be a recession in 1948.

A slackening of consumer demand, in spite of higher incomes, could become extremely serious were it not for a number of "cushions" which should make it possible for business to absorb a price break and continue operations in a better balanced economy, he declared.

"The coming price breaks—when they come—will widen the market to include more of the two-thirds of



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American families in the lower income groups which have many unfilled demands for goods," he said.

* * *

Aluminum Sheet Metal. The wise policy of promoting the use of aluminum in those applications where it "belongs"—where its merits make it logical for use permanently by that industry and not just as a temporary substitute—is paying off.

The possibilities for aluminum in the sheet metal industry have been borne out by the fact that the heating, ventilating and air conditioning industries offer an important, permanent, growing market for aluminum. More than 30 million pounds of aluminum sheet from Reynolds Metals Co. has gone into duct work and similar applications during the past year.

When Reynolds began actively pioneering sheet aluminum for duct work and similar applications two years ago, they also began development work to bring down the cost of producing sheet aluminum. It is quite evident that as the cost is lowered, the application possibilities will be greatly enlarged.

New low prices make aluminum sheet more competitive than ever, and many manufacturers are again reviewing the economics of using aluminum in their products, especially since the light weight of aluminum sheet gives the user three times as many square feet per pound of metal.

* * *

Not Just One Product. We have all heard of the old time, one-crop farmer who raised only cotton, or tobacco. In those years when there was an over supply of either, he was very poor indeed. The modern farmer diversifies his crop and he is not poor.

Manufacturers of machinery are engaged in a program of diversification

which may be classed as, 1) original pre-war products which have been improved and developed, 2) new products reaching new markets, with a different buying cycle of demand and depression, and 3) Government production requirements in military and ordnance products.

You may not build machinery, but whatever you make it may pay to gaze into the crystal ball through intelligent research and development and, like the modern farmer and the machinery manufacturers, avoid the lean years.

* * *

Informed Supervisors. Through knowledge comes understanding. According to an executive of the Corning Glass Works his company keeps all supervisory employees fully informed on company policies and problems. Discussions by top executives each month start it off, and they in turn hold informative sessions with plant managers and superintendents.

Any method whereby employes are made to understand the intentions, policies and problems of their employers is bound to result in higher morale and increased production.

* * *

Another New Car. Promised for the last quarter of 1948, the name will be Cortez. It will be manufactured by North American Motors, Inc., in a plant at Grand Prairie, Texas. Offices are to be maintained in Detroit, New York and Dallas. Principal tooling operations are expected to be confined to the Detroit area.

According to Ward's Automotive Reports the company plans to produce about 40,000 units in its first year. It will be a low priced six; will sell for about $1100. It will not be revolutionary.

It is said the name "Cortez" was chosen because it can be pronounced

(Continued on page 100)

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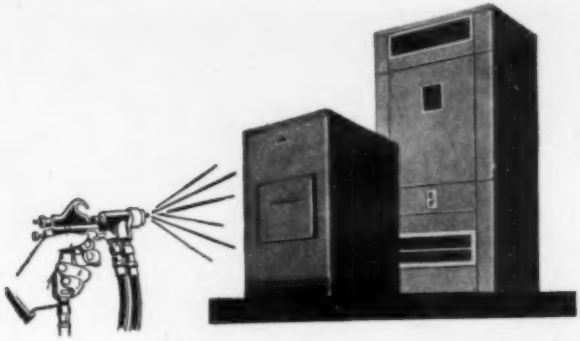

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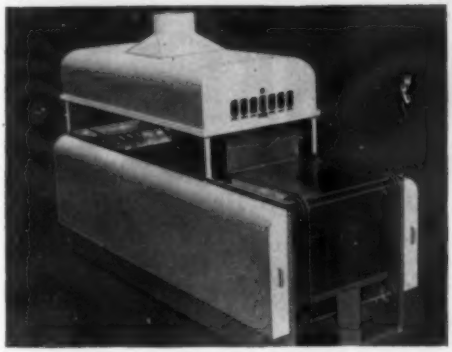

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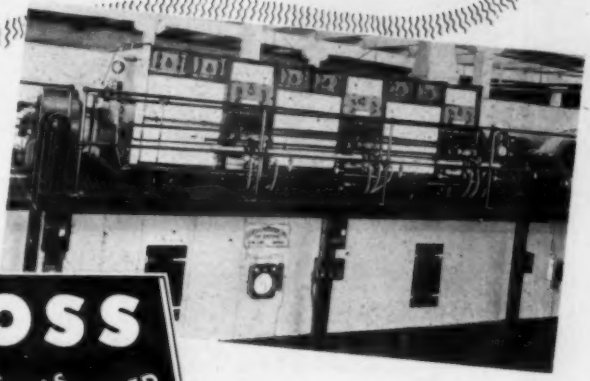

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Illustrations:

TOP: *Caterpillar drive; also shows lower tray for carrying material required for each unit.*
CENTER: *Covering operations.*
LOWER: *Finished furniture ready to be removed from conveyor for steaming and crating. Photos courtesy of Charles Mfg. Company.*

PALMER BEE COMPANY

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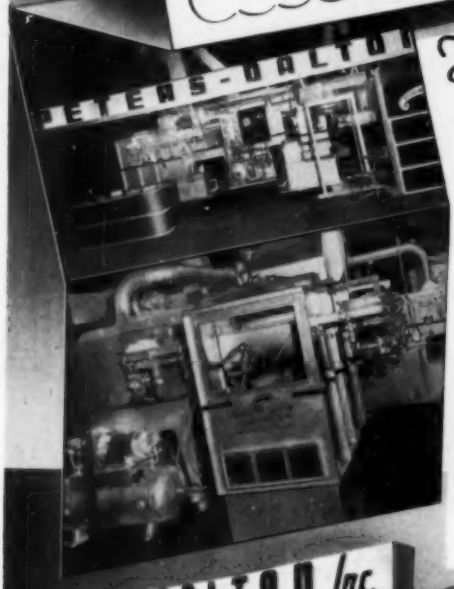

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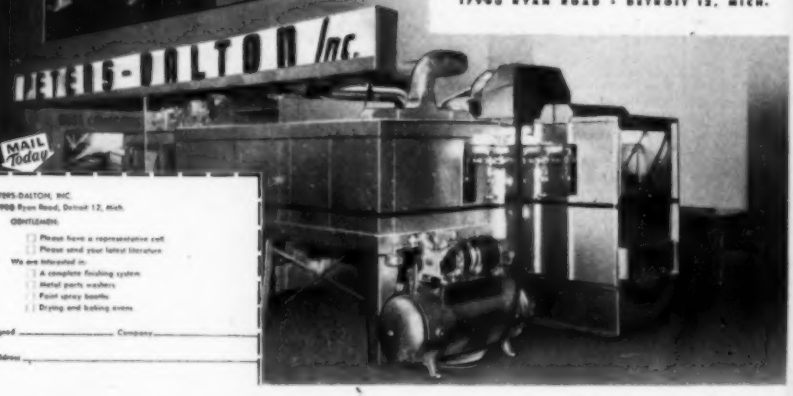

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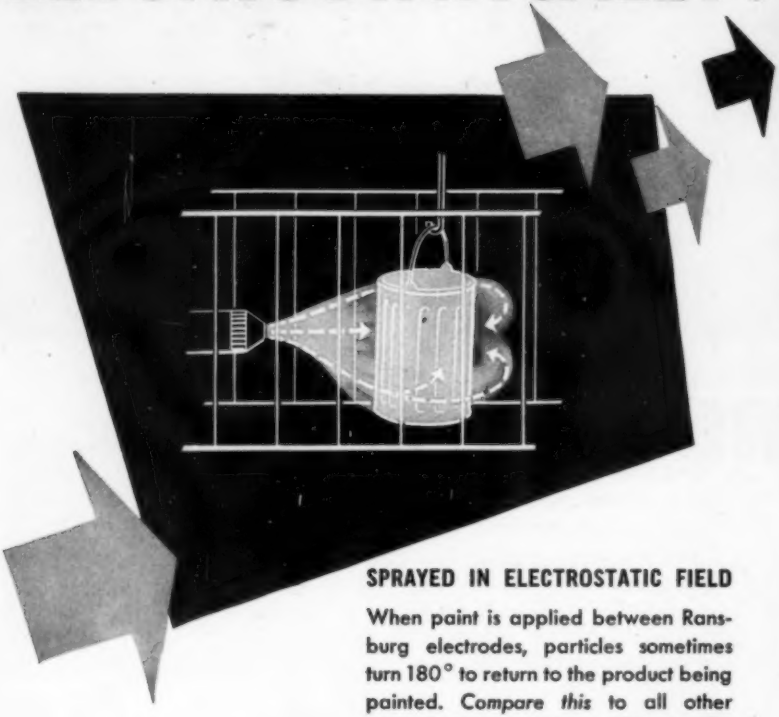

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What to keep in mind about Dip Coating

By GREGGS PHILLIPS

SOME MONTHS ago a firm that makes wooden croquet balls and mallets, asked for suggestions on how to apply a high gloss natural finish on its products. The company's inquiry appeared in the Question and Answer department of this publication. Five apparently well informed and experienced finishers offered equally as many different solutions to the problem.

It is entirely possible that an amalgamation of the recommendations given in answer to the inquiry would pave a road to the solution of the stated difficulties. Sometimes, however, confusion results from kindness; and at other times the confusion is kept in a state of turmoil because the latent factors responsible for ill effects cannot be clearly developed.

To refresh your memory on this, I'll quote part of the question as follows:

"We have tried tumbling, dipping in volume and, as a last resort, dipping each ball and mallet on a string. In spite of every attempt, the material tends to pile up, such as the last drop on the bottom of the ball. We tried lacquering our product but blushing, because of dampness, made this operation unprofitable. At the moment we are using a vinylite finish which does not blush, but the finish is not brilliant enough."

Difficulty of Dip Coating Croquet Balls and Mallets

As a matter of academics, let it be accepted that dipping the balls and mallets was, in this case, the most expedient method of finishing. In spite of the disappointing results, the concern expresses by implication that it wants to handle this production job by dipping.

Blushing is alleged to have caused the manufacturer to discard further consideration of lacquer. It is presumed that retarders were emloyed but without complete success in eliminating the blush, and that despite retarder additions the blushing appeared where the finish build-up was heaviest.

The manufacturer points out that in spite of other attempts, "the material tends to pile up, such as the last drop on the bottom of the ball". It is further assumed that satisfactory results were not obtained in the initial efforts toward successful application. Repeated attempts with various manufacturers and individual formulations

led, constantly, to the state of confusion referred to, when possibly a little "time out" in consideration of some of the principal factors involved had been overlooked.

Regardless of the details responsible for the success in any one coating system, such system, when adopted, will continue successful only when the variables (such as variations in the temperature, of the air, the work and the finishing material; and dipping viscosities in relationship to the shape and size of the work) remain constant to within practical working limitations.

Automatic Spray Coating Suggested — If and When

Automatic spray application should, without question, provide a final finished surface that is entirely free from the potential undesirable effects sometimes encountered in dip coating. In recommending automatic spraying, I assume the plant is equipped with automatic spray equipment, and that the price of the finished products will justify the costs of automatic spraying.

Again, reverting to academics, a dip coating with the desired final film properties as a known quantity could be formulated by a supplier willing to cooperate with this firm. If the maker of croquet sets has enough floor space to permit the use of a straight air-drying varnish, the cooperation of an interested supplier should also result in a special formulation having the desired final film properties, as well as the required working property.

Fundamentally, the final deposit of finishing material consists of what is commonly referred to as the "solids" or "non-volatiles" or the combination of film-forming ingredients. Solvents and diluents for these film-forming ingredients—commonly referred to as "volatiles"—are merely vehicles by which the film-forming ingredients are transferred to the work and which, after their evaporation, leave an evenly deposited film of protection over the work.

Characteristics of Lacquers and Varnish Coatings

With any finish, whether it is lacquer, varnish or synthetic (air-dry or bake) there is a definite limitation in viscosity consideration. Lacquers are characteristically high in viscosity in comparison to their solids content. Varnishes and straight synthetics, as well as combinations of lacquers and synthetics are higher in solids content, as compared with a definite viscosity lacquer range.

If lacquers could have the solids or non-volatile characteristics of asphalt, and a spraying viscosity at ordinary temperature, the formulator would have reached and attained the Utopian.

It appears that a solution to the problem rests largely in establishing, as a first specification, a formula having maximum solids with a minimum viscosity. From this point on, success of the application, whether or not the material is lacquer, varnish or even a self-polymerizing molasses, depends upon: 1) balancing the physical forces of surface tension; 2) determining which factors will be constant under a given set of conditions, such as the respective temperature of the air, work and dipping solution; and 3) the constancy of working surface characteristics such as porosity, moisture content, and the specific tenacity of the finishing material in its wet form for the surface being coated. The only variable then remaining would be the rate at which the work is withdrawn from the dip tank.

Viscosity of Coating Material Must be Suited to Work

Viscosity, which plays hand-in-hand with surface tension, is resonsible for a large amount of finishing material

being picked up by the dipped pieces when they are withdrawn from the dip tank. The more rapid the rate of withdrawal, the greater is the quantity of viscous finish that remains clinging to the work. If the withdrawal rate is held constant and fast, the only corrective measure in eliminating a large "cling" would be in reducing the viscosity. This change could be accomplished by increasing the temperature of the dipping material, or by the addition of thinner. Use of either of these methods to reduce the viscosity of material would throw all of the other factors out of balance.

Rate of Withdrawal for Smooth Dip Coating

Assuming that some reasonable rate of withdrawal has been established, and that the quantity of finishing material clinging to the dipped pieces is somewhat excessive (at least to the point that the finish still tends to pile up on the under sides of dipped pieces) the proper correction would be to decrease the rate of withdrawal. A practical and economical way of slowing up the rate of withdrawal is to employ a subsiding tank whereby the work remains stationary and the dipping solution is withdrawn from the tank, (by being pumped or with gravity feed) into another tank or reservoir. To determine the best rate at which the finish should subside past the stationary work in the dip tank, practical laboratory experiments are desirable. The rate at which the finish is subsided is in indirect proportion to the uniformity of the film deposition over the entire work surface. In other words, the faster the fluid is withdrawn from the tank, the greater is the difference in deposit of wet film thickness measuring from the top to the bottom of the work.

One precaution to consider when using this method is to get the rate of subsiding so slow that the buildup is almost negligible. The subsiding rate might have to be faster than what is desirable for the final uniformity of film thickness and elimination of "the last drop on the bottom."

Inverting the Dipped Work Right After Withdrawal

If the application proves the necessity for such a rapid subsiding rate, correction can be effected by inverting the work after it is removed from the dip tank. The solvent vapors existing over the liquid level in the dip tank retard the rate at which the volatiles are dissipated from the wet film deposited on the work; consequently, the moment the work can be removed from the subsiding dip tank, the finish, even if it is lacquer is still wet enough to have sufficient running property to even out over the work surface if the work is inverted in proper time.

I have used this system in overcoming similar difficulties in the finishing of other types of merchandise. In the case of croquet balls no special precaution should be necessary, but with the mallets it would be highly desirable to position them in the dip tank in such a way that as the finish subsides it leaves the work from an edge, preferably a corner, rather than from a flat surface. The success of the system requires some patient indulgence in determining the rate of subsiding. This rate depends upon the viscosity of the particular finish at hand, as well as considerations in the viscosity-solids relationship to the size, shape and surface condition of the work to be finished.

Fire Resistant Coatings for Christmas Trees

A bulletin that tells how to treat Christmas trees to reduce fire hazard, including formulas for coatings, can be obtained free by writing to Forest Products Laboratory, Madison, Wisc., and asking for Technical Note No. 250.

A BUYING GUIDE FOR ABRASIVES

Point No. 11

District Representation

Certain buyers of abrasives find the measure of their sources of supply in the local representatives of abrasive manufacturers. Therefore, it is a matter of great satisfaction to us to have men of ingenuity and experience representing us in key locations throughout the country. It is by means of our district organization that users are given direct access to the engineering, research, and wide scale technical activities of The Carborundum Company. It is their intelligent handling of abrasive problems, and their sincerity in serving customers' needs that makes every user think first of CARBORUNDUM, when they think of abrasives. The Carborundum Company, Niagara Falls, New York.

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Equip your air and fluid hose with the proper DeVilbiss Connections and profit from the savings in labor, reduced waste from leakage and lower replacement costs.

DeVilbiss Quick Detachable Connections permit a single air line to serve many functions with maximum efficiency. The customary tangle of numerous air lines is eliminated and many spray guns and air tools can be served from a single air line. A twist of the wrist "CLICK" and air tools go into action. No screwing nuts on and off—no shutting off air lines—no crimping air hose to make a slow connection—no premature hose failure due to pinching. DeVilbiss Quick-Detachable Connections are adaptable to the air inlet of the tool as well as to air supply take-off points.

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Like every item of equipment in the complete DeVilbiss line, *DeVilbiss Connections are built better* to provide finishes of finest quality. Consult your DeVilbiss engineer for advice on your hose connection problems and for expert help on all your equipment requirements.

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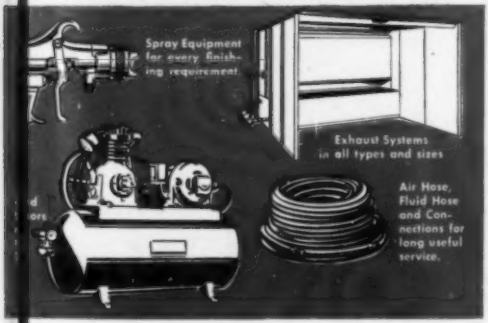
Spray Equipment for every finishing requirement
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Air Hose, Fluid Hose and Connections for long useful service.

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PRAY EQUIPMENT
EXHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS

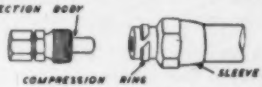
DEVILBISS HINTS . . . on *Finer Finishing*

HOSE CONNECTIONS ARE *BIG* DETAILS

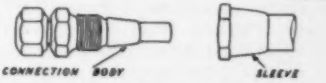
No link in the chain of spraying equipment is so small that it can afford to be neglected. Efficient operation means more than merely connecting hoses. It is a costly mistake to overlook the genuine value of this seemingly little detail.

Some operators try to get by, using wires and improvised clamps to couple hose. This is false economy and a poor substitute, for makeshift couplings may snag the hands and cut the hose itself besides permitting leaks which quickly inflate air costs. Good connections hold the whole spray line tightly together. They should require no special tool and little time and effort to couple. They should be leak-proof and last the life of the hose and still be reusable on new hose.

Hose connections are generally either the Compression Ring Type or the Expander Screw Type. In the Compression Type an



extension of the connection is inserted into the hose body and the compression ring clinches the hose as the tapered collar is screwed onto the connection body. Because of ease of coupling hose with the compression ring connector, this type is preferred in most all cases.



In the Expander Type, a tapered stem is thrust into the hose body. The collar is then drawn up to the connection pulling the hose tightly up on the tapered stem. In order to attach this connection, it should be put in a vise so as to exert enough force to push the stem far enough into the hose body to allow the collar to grip the threads of the connection.

Bending hose double to shut off the air is most destructive. A Quick Detachable Connection prevents this destructive practice since an automatic valve closes off the air flow when the coupling is disconnected. No need to run to shut off the whole air line nor to kink the hose.

By quickly plugging in such a connection with a simple twist, the air-tight connection is assured. Switching from one tool to another with a single air line is a moment's work. No need to clutter the shop with a tangle of duplicate hoses. No wrench is necessary, and the wear and tear so common to threaded connections is entirely eliminated.

FINISHING SET-UP OF A VARIETY OF *Metal Products*

THE WARNER MFG. CO. plant in Glendale, Calif., manufactures a variety of metal products for Pacific Coast customers. Its finishing department receives a large portion of incoming work from the die-casting department—usually after the parts have been routed through certain operations in the machine shop. The die castings are made of aluminum alloy, magnesium, zinc and manganese bronze, in various shapes, plain and intricate, large and small.

Aluminum Alloy Bodies of Haylo Gas Heaters

To get an idea of what goes on in the finishing room, let us follow the aluminum body of a Haylo gas heater. The aluminum alloy body is formed in a die-casting machine; several machine operations follow. All "flash" is trimmed from the louvers by a special machine. Surfaces are sanded on belt sanders, and some work is performed at the burring and filing benches to further smooth down rough spots inside and outside. Spot puttying is applied where necessary to give a perfectly smooth surface for the paint coating.

The bodies are put into galvanized wire baskets—two to a basket—which hang on a conveyor that moves through a degreaser. Baskets of work move through the degreaser at the rate of 360 an hour. The conveyor travels 6-ft. a minute. As cleaned products arrive at the unloading station they are taken from the baskets and moved by trucks to a storage bank close to the spray booths.

Pressurized Spray Room Has Two Conveyor Lines

The pressurized spray room is 65-ft. long, 17½-ft. wide and 8-ft. high. Heater bodies move through the spray booths on a belt conveyor. They rest directly on galvanized iron trays which ride on a thick 14-in. belt which travels along the center of small steel rollers mounted on 3-in. centers. The roller line is 30-in. wide and 31-in. above the floor. Next to the loading area there is a 5-ft. water wash spray booth; then a 2-ft. space and another spray booth. Both spray booths face the conveyor line but they are

★

By FRED M. BURT

★

Following a few die cast metal parts through production areas which are set up to smooth and clean metal surfaces; spray on durable decorative finishes in a conveyorized spray room; and to dry the paint coatings in a preheating zone and infra oven.

on opposite sides of it and are set in staggered arrangement. Each booth has a 30-in. exhaust fan.

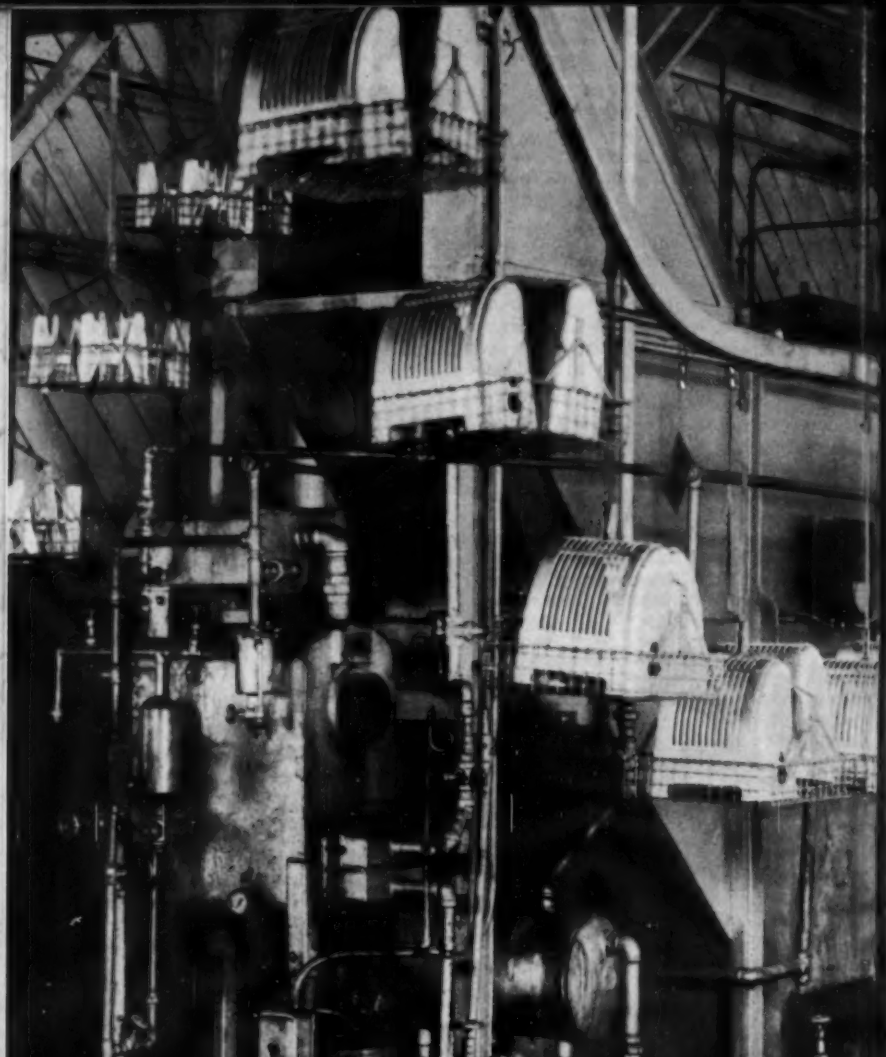
As many as 1500 heater bodies can be sprayed with a Hammertone finish in two shifts. This work is handled by one painter, one loader, one inspector and one sander. Two of the heater bodies are placed upright on a tray. The painter sprays the top and left side first. Then, with one finger under the bottom, he turns it to spray the back; again he turns it to spray the right side; finally he turns it a third time to spray the face side.

Guns Taped Together to Spray Special Finish

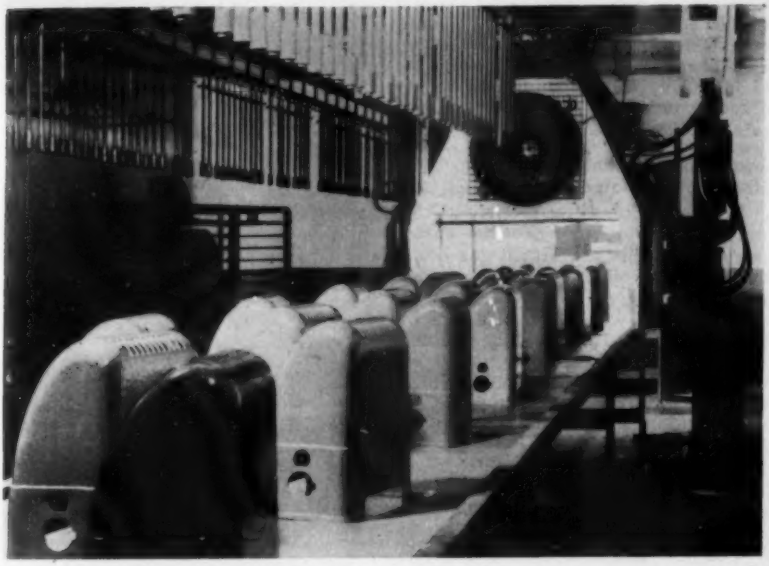
The finishing foreman, John C. Quackenbush, has devised an ingenious method of spraying both the base coat and the splatter coat with what is, in effect, a single spray unit. Using two standard spray guns, he binds them together with 1-in. masking tape. Naturally the tape is much lighter than any metal fixture that could be devised, and it can be quickly and easily removed for cleaning the guns. The gun that sprays Hammertone is mounted at the left and above the splatter gun. Each gun has a specific type of head suitable for its particular work. First the sprayer applies a Hammertone coating by pulling the trigger with his index finger. Then he can use his little finger (below) to pull the trigger of the splatter gun; or he can move his left hand to do that job. This is much faster than using two guns separately. *(Continued on page 39)*

Spray painter, with "double gun" for spraying both Hammertone and splatter coatings, painting heater bodies in water wash spray booth. Heater bodies are supported on flat sheet metal trays which ride along on a belt conveyor.

Belt sanders are used for smoothing down the surfaces of Haylo heaters.



Heater bodies (two in a wire basket) move by conveyor through a degreaser. At left are baskets of small parts entering degreaser. Some of the solvent distillation equipment appears in middle and left foreground of the picture.



Sprayed heaters moving by flat bed conveyor into preheater and infra-red oven. Notice how heaters are placed, two to the tray. In upper background a ventilating fan pulls heat from the oven and blows it into the preheating zone. Above are the fixtures used to carry insecticide bombs on the hanger line. They can pass through the oven when the preheater is removed and the top banks of lamps are set in vertical position.

Preheating Zone Ahead of Infra-red Oven

Beyond the second spray booth is an open space 18-ft. in length and then a pre-heating zone just ahead of the infra-red oven. In the upper forward part of this pre-heating space a fan draws hot air out of the oven. Pre-heating is used chiefly on wrinkle finishes to prevent blisters which otherwise might be caused by using a quick high heat at the start.

The infra-red oven is in four 42-in. sections. Each section has eight 375-watt infrared lamps on each side, and 12 overhead. This makes a total of 112 heat lamps arranged in seven longitudinal rows of 16 lamps each. The lamps have dual reflectors which add about 20% to their heating capacity, giving an oven heat up to 345° F. when the roller conveyor line is used. One reflector is built into the lamp and the other is positioned behind it.

Oven Setup for Overhead Conveyor

When the overhead chain conveyor is used (instead of the flat-bed conveyor) the hood above the infra-red oven is removed. Two rows of the top lamps are swung back into vertical position so they are in line with and above the lamps on one side (like putting on an extra side board). The remaining row of top lamps is swung into vertical position above the lamps on the other side—and an additional

row of lamps (to make it even) can be added when desired. While lamps of 375-watt rating are used, the wiring is heavy enough to supply lamps of 500-watt rating per lamp, with a total of 128 lamps in the oven.

Inspection of Paint Jobs; Highlighting Nameplates

From the unloading section of the roller conveyor, outside the spray room, the bodies for Haylo gas heaters are taken off by an inspector and placed on trays on another roller conveyor which extends out at right angles. Emptied trays slide off the end of the conveyor, to be caught on one of the little 4-wheel dollies which are used to return them to the other end of the line for re-use. The 20-ft. long inspection conveyor delivers heaters to a workman who highlights the "Haylo" nameplate by carefully pressing the metal body against a vertical belt sander.

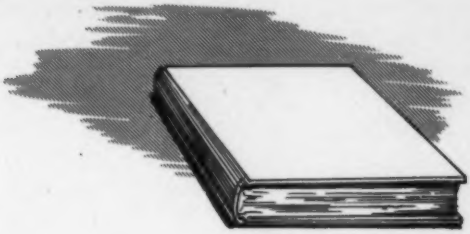
The few finished heaters that do not pass inspection are placed on multiple-deck portable racks and marked to identify the shift that produced them, so they can be carefully examined by the foreman next day. He keeps in close touch with every phase of the department's operations and can quickly determine what deviation from proper practice caused the defect or objectionable feature. This enables him to make the necessary corrections quickly. The heaters are then re-worked to pass inspection.

Tiny Mite Banks in Wrinkle Finish

The finishing department is set up to operate in three shifts. Shift No. 1 is from 7 A.M. to 3:30 P.M. At the time of my visit to the plant, the No. 1 shift was spraying Tiny Mite bank bodies and lids, using two spray booths for a production of from 3500 to 4000 each of bodies and doors. The personnel included two painters, one loader, one inspector, and a part time handy man. This same shift can spray 10,000 to 15,000 stamped aluminum tile in sizes of 4x4-in., 2x4-in., and 1x4-in., in any of nine colors.

High-lighting the "Haylo" nameplate on heater (by pressing it lightly against a vertical belt sander) is the last production operation on heater bodies. They are then ready for final assembly.

Tiny Mite banks are minature safes which have doors fitted with a combination mechanism. The bodies are loaded on trays—20 bodies to a tray, or 49 doors to a tray. They are sprayed on both sides (as they pass though both booths) with pink, blue or black wrinkle finish. Conveyor speeds range from 1¼-ft. to 2½-ft. per minute. Doors are first sprayed on the face side; then, as they move along the



Some surfaces fool you!

TAKE the surface above, for example. Wouldn't you think a dime would fit easily into that white area without overlapping? Try it!

IT'S the same way with metal surfaces that are to receive electro-deposits or organic finish. They can sometimes fool you too! They LOOK clean and ready for finishing but oft-times when finish is applied, poor grippage . . . uneven coverage result.

BUT we guarantee you'll not be fooled by Oakite-cleaned surfaces, because Oakite cleaning compounds are specially designed to remove heavy grease, oil and ordinary shop-dirt from ferrous and non-ferrous metals. Specialized Oakite cleaning puts surfaces in precise condition to receive tenacious, long-lasting electro-deposits or organic finishes.

OAKITE in-plant service, too, is something you can rely upon. We want you to make full use of it whenever a troublesome cleaning-before-finishing problem arises . . . whenever you've a need to pare production costs . . . whenever you want to streamline your cleaning cycle. Simply drop us a line or call your local Oakite Technical Service Representative. Remember, there is no obligation.

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inspection section of the conveyor, they are turned over; the trays that carry them are placed on 4-wheel dollies and returned to the starting point so the backs of the doors can be sprayed.

When aluminum tile is being sprayed the doors of both ends of the spray room are closed. In preparation for tile runs, in order that no particles of dust or lint may settle on the sprayed surfaces, the floor is carefully swept with compound and all loose dust is wiped from other surfaces. Also, all workers in the room wear starched uniforms so that no lint will come from them. Outside air is admitted through 20-in. square filters on each side of the pressurized spray room.

Overhead Conveyor Setup

One of the several products which is carried through the spraying and drying setup by the overhead conveyor line is an insecticide bomb. These bombs are spray painted with one coat of air drying lacquer. They are hung from 20-in. long hanger fixtures. At the upper end is a small pinion which engages a rack as they pass through the spray booth. This arrangement causes them to revolve.

All paint materials are mixed in a nearby room and delivered to the spray booths in 15-gallon pressure tanks. Some 5-gallon units are used for special jobs. These tanks are moved in on low 18x18-in. dollies.

A considerable variety of other products—aside from those mentioned here—are spray painted in quantities. On all of them the volume of continuous production and high quality finishing, in relation to man hours and space involved, is rather remarkable. In the opinion of this writer, the major reason for this excellent showing is the quality of foremanship at this plant—in cooperation with modern engineering and production planning.

Surface Preparation and Painting Setup

A NEW 5-STAGE conveyorized Bonderizing system, used for chemically converting metal surfaces to thin layers of myriad microscopic phosphate crystals which serve as rust inhibitors and "anchors" for enamel, has been installed in the enameling department of the Harley-Davidson Motor Co., Milwaukee, Wis.

Parts, such as rims, chain guards, forks, and many miscellaneous items are first conveyed into a spray cleaning compartment where oil, grease and other foreign matter are removed. A hot water rinse, one-minute of Bonderizing, cold water rinse, and a final chromic-acid rinse completes the 5-stage chemical process.

Observation of parts coming out of a new 325° F. drying oven reveals a distinct change in physical appearance; the surface is finely-etched. It is this coating of nonconductor phosphate crystals that serves as an enamel "anchorer" and rust inhibitor.

Corrosion, for example, resulting from a nick or scratch in the finish does not creep and spread its discoloring action to the surrounding area. Corrosion is localized to the area scratched, the pernicious effects of oxidation being unable to affect the nonconductor "skin" of phosphate crystals.

New equipment has also been installed for the two enamel dips and the subsequent baking operations. Modern electrical controls closely regulate temperatures.

The complete system travels at the rate of 4-ft. per minute, takes four hours for a complete trip on the 960-ft. chain. Because such parts as fenders, oil tanks, and tool boxes are spray-enameled, they are removed after Bonderizing to another conveyor and passed through a spray booth for a prime coat, after which they are

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For use one volume of Sol-Klean is diluted with 2 or 3 volumes of water. The resulting solution is usually brushed on the metal at room temperature. It adheres to the oily surface, penetrates the oil and mixes with it, and dissolves the rust. Then the Sol-Klean is removed together with the dissolved oil and rust by wiping with rags or flushing with water.

Metal may also be cleaned and treated by immersing it in hot Sol-Klean and rinsing it in water. Sol-Klean is non-inflammable and no noxious or corrosive fumes are evolved.

Sol-Klean is easy to use and can be made an integral part of your production line.

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baked, processed for another spray-enamel finish coat, and finally baked again.

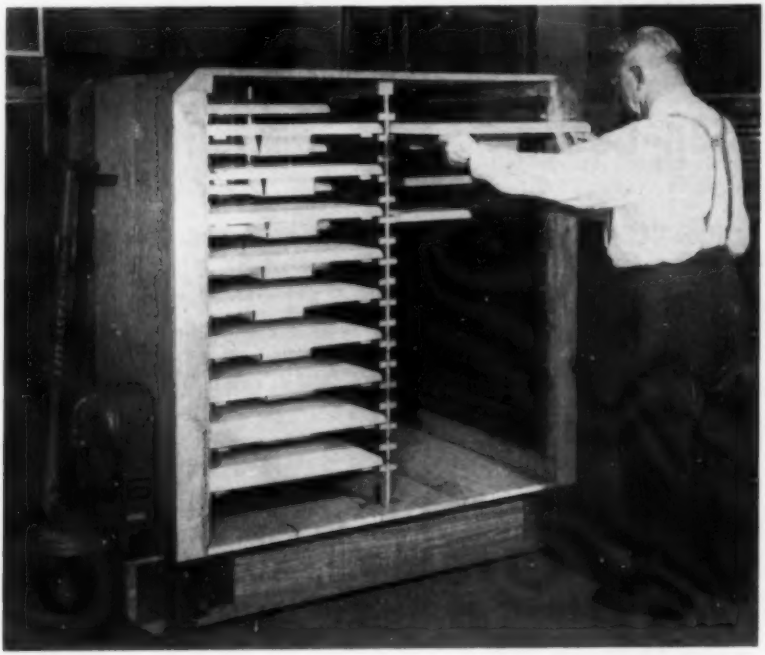
The plant's expansion program also includes two spray enamel conveyorized systems.

Portable Rack for Finished Parts

IN THE manufacture of its hydraulic dishwasher, Kaiser Fleetwings, Inc., Bristol, Penna., has devised an ingenious rack for protecting finished parts which must be moved by a lift truck. The rack keeps the freshly-enameled cabinet doors from scratching one another during storage and transportation between the finish baking oven and the cabinet assembly area.

The accompanying cut shows how plywood and felt sheeting have been used to construct a simple superstructure atop a standard lift truck skid. Eighteen lined grooves are provided on both sides of each of two compartments of the rack; thus, 36 door assemblies can be loaded.

Something similar to this felt-lined multiple rack might be useful in many factories. The rack was designed and built by men in the factory where it was used.



Felt-lined multiple rack for finished parts to be moved from bake oven to assembly department. Photograph courtesy of Yale & Towne Mfg. Co., Philadelphia, Penna.

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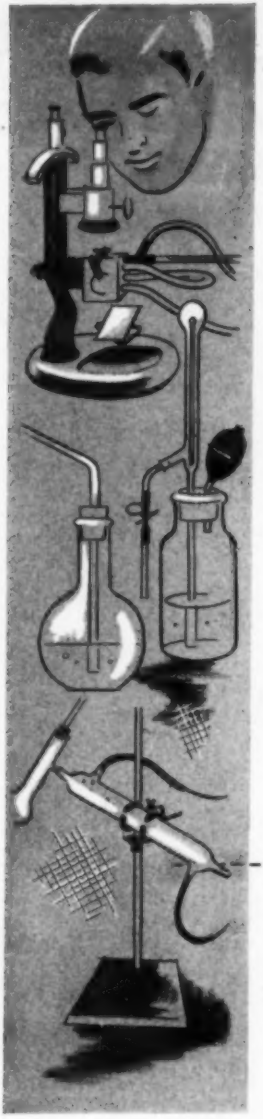

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Finishing BRIAR PIPES

By HORACE WOOD, Jr.
Chemist in Merrimac Division of Monsanto Chemical Co.

MODERN REFINEMENTS of daily comforts have not overlooked the ancient art of pipe smoking. Pipes have changed with the individuality of the pipe makers since the heyday of the velvet-gloved meerschaum devotees.

Improvements have been designed for mass manufacture to meet the demand for glossy luster and blister-resistant surfaces. Continued experiments in our research laboratories have resulted in the formulation of pipe lacquers that meet the manufacturer's requirements.

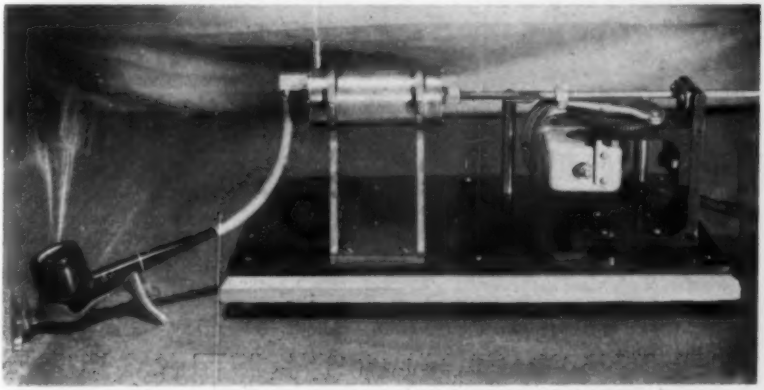
In order to understand the problems involved in the evolution of lacquers R-5030 and R-4086, it is necessary to understand the manufacturing methods used by pipe companies.

Seasoned Blocks of Briar Are Formed into Pipes

The briar is cut into small blocks and aged in large baskets for a period of several months. The blocks are then roughly cut on two separate machines. One machine rough cuts the shank of the pipe, while the other shapes and reams the bowl. Immediately after this rough shaping, a drill press is used to make the bore. After the bore has been drilled and threaded grommets have been fitted, the stem is put into the pipe. From then on the two pieces are never separated.

Next comes the smoothing and finishing of the pipes. This is accomplished with a buffing wheel and sanding pads of various sizes and shapes. Pipe stems and the shanks they join are sanded to fit exactly flush therefore the stems are not usually interchangeable from one pipe to another.

The formed and smoothed pipes are taken to the finishing department where they are stained with an al-



Test-smoking a finished briar pipe with the aid of modern laboratory apparatus.

cohol stain. Two coats are applied to produce uniform staining and to give added richness of color. Stained pipes are allowed to stand 36 to 48 hours before spraying. Two coats of pipe lacquer are applied by a continuous automatic spraying and drying machine through which the pipes move by conveyor. Each pipe is supported by a spring wire holder.

At the completion of the spraying cycle the pipes are allowed to dry overnight. Then they are buffed with a special compound to give the finished pipe a uniform luster. The final buffing is with a dry wheel. Several pipes from each batch are test smoked to be sure that the finish is satisfactory.

Requirements to Observe in Making and Finishing Pipes

From this discussion of the manufacturing procedure certain conclusions may be drawn. First, no high temperatures may be used in the finishing schedule because the stems are of hard rubber which would surely become misshapen because of the stresses released.

Second, the amount of moisture that may be taken from the wood, before the pipes are formed, is limited because of the fact that chipping occurs in that operation if the wood is too dry.

Third, if the bowls are dried after they are formed, but before the stems are fitted, they will shrink and often times chip or crack on the sanding wheels.

Fourth, the lacquer must be of low viscosity, but it must give sufficient "build" to produce a satisfactory finish.

Fifth, the lacquer must dry rapidly so that the second coat, after being applied to the finished pipes, may be handled about five minutes later.

Sixth, the lacquer must be hard enough to buff well and still have good adhesion.

Seventh, the lacquer must not blister when the pipe is smoked.

Other desirable characteristics of a good pipe lacquer are proper bleeding of the stain into the lacquer; durability, perspiration resistance, and a gloss that does not become dull from continued smoking of the pipe. As in every industrial finish, the price must be comparatively low to interest the buyer and meet competition.

Lacquer Finishes and Special Baked Finishes

Because of the natural moisture in the wood—and some that will form in the pipe as a combustion product and which may get through the wall of the pipe—it is difficult to produce a lacquer that is so perfect that it will not blister.

In our experimental work we did formulate a baked finish which was applied to pipes that had been thoroughly dried. The results were excellent. Several pipes were smoked, by a smoking machine, until the wall of the pipe burned through, and no blistering was evident.

In the course of our experimental work many film-forming-resin combinations were tried, but with no improvement over our present product. We found that when a thick lacquer film was applied, blisters formed more rapidly than when a thin film was put on.

A "Soft" Lacquer Finish is More Likely to Blister

Lacquers that are soft, and which do not buff readily, seem to blister much more quickly than a hard finish. The rate of smoking, which of course controls the temperature of the pipe, is quite critical. We discovered that when the lacquer film over a blister was removed, we would usually find one or more imperfections in the wood. Attempts to seal the pores and cracks in the wood were not successful.

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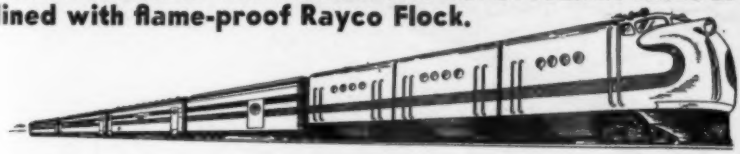

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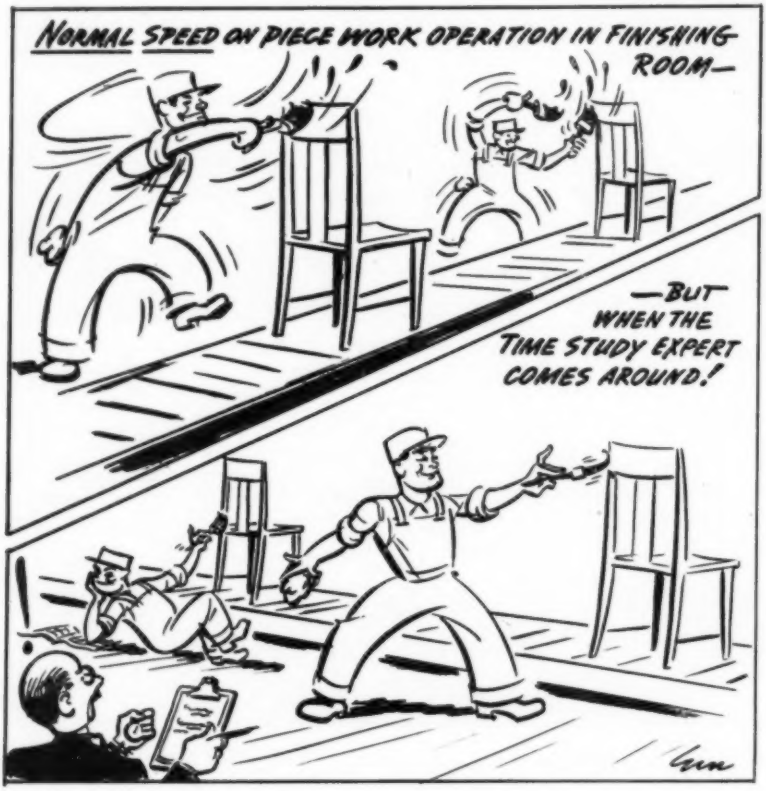
What They Did to My New Filler

By Raymond C. Adams

AN INCIDENT that happened to me several years ago has since struck me as very humorous, although at the time it wasn't so funny. It is quite typical of human nature. . .

I was at a chair factory, preparing to run a test on a quick drying filler that I had recently developed. The plant was modern in design and efficiency. All filler was applied by brushing, which on chairs, can be very time consuming—but it seemed that for various reasons brushing proved to be the most desirable method in this plant.

Eight men were at work in this department, and I couldn't help but marvel at the speed at which they worked. The men who brushed on



They'll do it every time. (With apologies to Jimmy Hatlo.)

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will give you a 30 minute dry, easier sanding, higher solids content than most sealers on the market today. 20% reduction.

A low cost that will fit in with your program of watching costs.

This sealer has less viscosity but more solids—and has stood 22 cycles in hot and cold reactions without any deterioration whatever.

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filler really slapped it on so furiously that it wasn't safe to get within 20-ft. of them if you wanted to be careful about your good clothes.

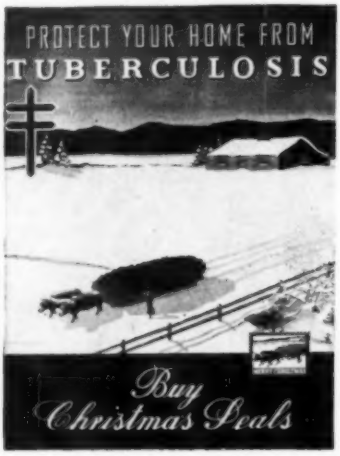
Among other things the management was interested in determining the ease of application and wiping chacteristics of my new filler. They had tested quick-drying fillers before and had found them hard to wipe.

My test had just gotten under way and was going along nicely when up came the timekeeper with a stop watch on his clip board, to check the rate of production being obtained with my filler.

Of all things, what do you think happened then? Those fast workers immediately slowed down to a snail's pace. The men who did the brushing—and had been splashing so much filler—slowed so much it appeared as if they were carefully brushing enamel on the chairs. They could have easily worn their Sunday clothes without getting a drop of filler on them.

The men who had been wiping the filler also slowed down so much that I was afraid the filler would set up before they could possibly wipe it off. It was perfectly obvious to me that some one was trying to throw me, and make my production look bad.

I was so completely defeated and embarrassed that I started to leave with my head bowed in shame. Suddenly the timekeeper came up and congratulated me, saying that they had obtained 30% more production with my filler than with their regular filler. Later I learned that those men worked on piece work rates and they were keeping their production down in order to avoid having their rates of pay lowered. It's a great life, so don't weaken.



Culp, Mgr. of Industrials Sales on Pacific Coast for P. P. G. Co.

Appointment of W. Ray Culp as manager of industrial sales, Pacific Coast, for the paint division of Pittsburgh Plate Glass Co., is announced by Herschel E. Post, general sales manager of industrial finishes for the company. Mr. Culp succeeds R. Stanton Richter who will serve the West Coast area as a sales representative specializing in automobile production finishes.

Associated with Pittsburgh Plate Glass Co. paint division since 1935, Mr. Culp has served in the company branches at Fresno, Sacramento and Oakland. He was appointed industrial sales representative in May, 1942, which position he held until his recent promotion. As manager of industrial sales, his headquarters will be at 7412 Male Ave., Los Angeles.

Mr. Richter has been associated with Pittsburgh Plate for 27 years. He served at Denver, New York and San Francisco prior to his appointment as manager of industrial sales, Pacific Coast during 1940. He is a past president of the Los Angeles P. V. & L. A.

H. W. Robertson Represents National Mfg. Co.

Hugh W. Robertson has been appointed industrial paint sales representative for National Mfg. Corp., Tonawanda, N. Y. Mr. Robertson, a native of North Tonawanda, was at one time associated with the Protective Coating Division of a plastics and chemicals company.

In 1939 he joined the technical staff of National Mfg. Corp., and for the past five years has been superintendent of the firm's "Luxall" paint division.

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The PULLMAN-STANDARD FINISH

IN THIS article I shall consider only the outside finish of steel passenger cars. The technique used in painting railroad cars is somewhat different from that employed in finishing most other products. In the first place, all previous ideas of finishing procedure must be adjusted to fit a much larger product. This goes for surface preparation, handling or moving the product, and the application of paint coatings.

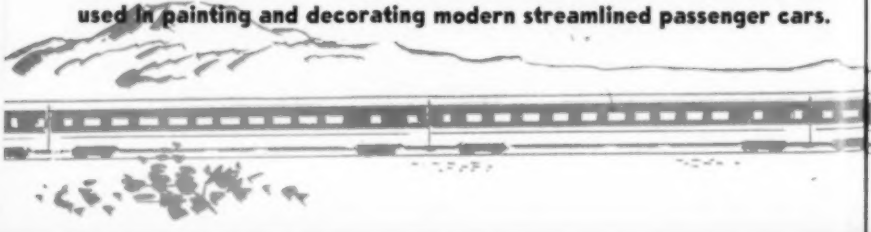
Every railroad has some exacting specifications which must be closely followed. All of them insist upon getting an enduring high quality finish. Everyone knows, of course, that the outside surfaces of passenger cars are subjected continuously to the elements, while the interiors receive wear and abuse by thousands of people, therefore the finish must be good.

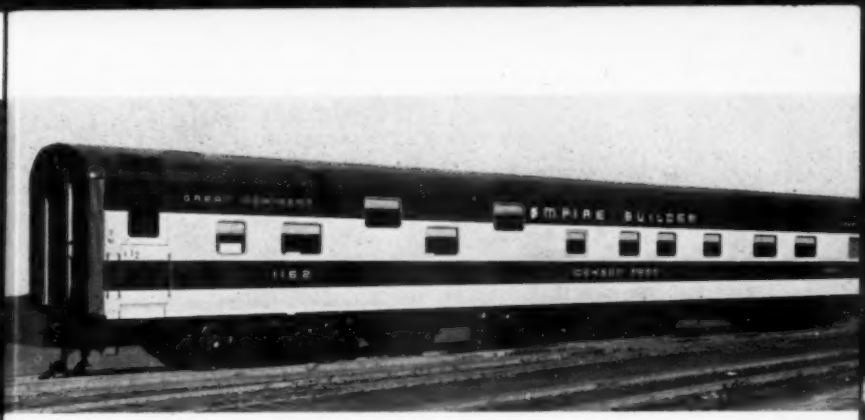
Thorough Surface Preparation Before Painting

Newly fabricated passenger cars are delivered to a building where partitions, ceilings and other interior parts are installed. During this time painters prepare exterior surfaces, beginning with the removal of all overlapping fitting-up paint. Next the

By W. J. BOLTZE

Part 1 of a two-part article in which the Foreman of Painting for Pullman-Standard Car Mfg. Co., at Chicago, describes the methods used in painting and decorating modern streamlined passenger cars.





One of the cars in the Great Northern's crack train, Empire Builder.

entire surface is washed with mineral spirits. Then the surfaces are gone over with a power-driven flexible abrasive disc. No. 24 grit emery is used. The surfaces are washed with a phosphoric acid solution and rinsed; just before priming, they are washed with alcohol.

Priming and Surface Coats; Puttying; Trowel Coats

The clear car is moved to a spray booth where a red-oxide base prime coat is applied. After an overnight air drying a surfacing coat is sprayed on, followed by another overnight drying. All spot weld indentations are filled with hard putty. Then follows two trowel coats of knifing-in composition over the entire surface except the roof. We allow an overnight drying between coats and at least 36 hours of drying before sanding begins. The first sanding is done by hand, using No. 120 or No. 180 grit, wet or dry abrasive paper with water. The men finish off with No. 240 grit abrasive paper.

After an overnight air drying, all high spots that have been rubbed through are touched up with primer and left to dry. Upon completion of all inside structural work the car is turned over to the paint department. It is moved into the paint shop for the completion of all painting work.

All outside surfaces are carefully checked and any dirt or smudges that may be found are removed with mineral spirits. After this going over the outside surfaces are lightly dry sanded with No. 240 grit paper. Now the exterior surface is ready for the enamel coats.

First Coat of Enamel; Sand; Additional Coats; Masking

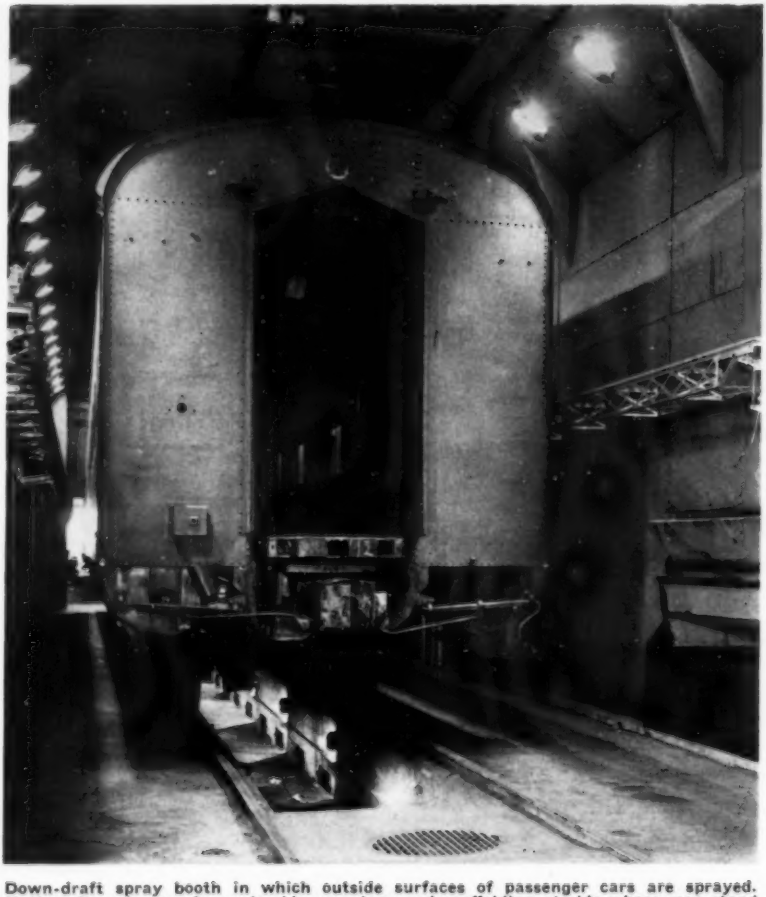
The first enamel coat is sprayed over the entire area, using the specified colors in their respective areas. Any overspray at dividing points is no problem because the lighter color is always sprayed first on the initial enamel application.

On the Great Northern's "Empire Builder" cars, one of which is shown

in this article, two colors are used—orange and olive green. In addition, two different colors of striping are used—imitation gold and aluminum.

Following the application and drying of the first enamel coat, the surfaces are lightly wet-sanded with No. 320 sandpaper. The second and third orange color coats are applied in the window and lower girder sheet area, allowing an overnight air-drying between coats. Repeating coats within a 2-hour period, as is sometimes ad-

(Continued on page 60)



Down-draft spray booth in which outside surfaces of passenger cars are sprayed. Notice pit under car for underside spraying—and scaffolding at side where men stand to spray the roof of a car. Also, note the excellent lighting provided in this booth.

HIGHWAY GIANTS

① *Spray finishing 20 buses at a time is an everyday job at the Dowst Mfg. Co. This Binks installation is tailor made for the problem at hand. A conveyor system carries trays of the small toys past the water curtain of a Binks Dynaprecipitor water wash booth. The trays rotate as they pass the spray station. A Binks spray gun coats them uniformly on all sides in one fast operation*

② *These five units are Binks Dynaprecipitor water wash booths designed especially for the General American Aerocoach Company. Each booth has its own air supply and exhaust system. Outside air enters through the large "twin ducts" in the fore part of the booth. The air is conditioned . . . thoroughly cleaned and heated . . . before it enters the booth.*

③ *The conditioned air enters the booth through the filters shown in the rear of this picture on each side and across the top of the door. All lighting is concealed and is strategically placed to avoid shadows. To finish the top of the buses, the entire coach is lowered into a pit as shown.*

④ *The water curtain shown behind the operator is part of a large Binks Dynaprecipitor water wash unit. All fumes and paint-laden air are withdrawn from the booth through this unit. Five thorough washings remove virtually all suspended paint before the air is vented. Off-spray can be reclaimed if such economy is practiced.*

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vocated, does not permit a proper build-up of the necessary film thickness, which is so essential on all railway equipment. Remember, these cars are not only subjected continuously to the elements—sun, wind, rain, snow, sleet and dust—but to the wear of mechanical car washers which are used by many railroads.

This painted area is then masked, lapping the edge along a line which will ultimately be the striped edge. The second and third coats of olive green are applied in the same manner as the orange color.

After a drying period of not less than 16 hours, the car is ready to be masked for its stripes. Then the first and second striping enamel coats are sprayed on. Because of the wide space between stripes, both colors can be sprayed at the same time. After an overnight drying, the masking paper and tape are removed. The car is now ready for lettering which is done with a brush, using two coats of enamel. Each railroad specifies the names and numerals for its cars.

Polished Stainless Steel Must Be Etched to Hold Paint

The Rock Island's "Golden Rocket" has a body of fluted stainless steel but the upper portions (window area and roof) are painted a bright red. The girder sheet area is given a polished metal finish. The same system of preparing metal surfaces for painting is used on these cars as on all other painted cars.

It may be interesting to dwell, for a moment, on the preparation of the letter-board panels. These plates remain finished in polished stainless

Spray painting flat and curved metal panels as they move through spray booth by belt conveyor. The panels actually rest on corrugated paper mats which cover the belt.

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In fact, one lock manufacturer not only greatly improved his product with A-112's combination of properties, but actually saved production time. Its exceptional adherence eliminated his need for cleaning brass after buffing.

Whatever you make, chances are there's a Unichrome Coating that's *exactly right* for your product—for service requirements, for eye-appeal. It will pay you to look it up. Write us today on the properties you need in a coating, and we'll send you full information. No obligation, of course.

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steel, but the lettering is painted in color. To obtain a good hond for the paint it is necessary to roughen or etch the surface of the stainless steel. Accordingly, the letters are etched with acid to a depth of one to two mils, which is sufficient to accomplish the bonding objective.

Stainless steel plates are etched for lettering before they are applied to the car. The entire plate is masked with a specially prepared masking tape. Letters are pounced on and cut out; letter edges are then rolled to press them down tightly to the metal; a solution of nitric and muratic acid is applied; an interval of 10 to 12 minutes is allowed for the acid to produce the desired depth of etching.

The etching acid is then rinsed off with cold water and the surface is left to air dry, after which a coat of primer is sprayed on. This is followed by two coats of synthetic enamel of the desired color; in this case black was used. After the enamel has had time to dry, the masking tape is removed and the letter edges are trimmed if necessary. Then follows two coats of clear synthetic varnish, hand penciled over the letters. The plates are then applied to car sides.

Editor's Note: This is the first of two articles by Mr. Boitze. In the second, which will appear in a future issue, he explains methods used in finishing the interiors of modern passenger cars.

Beck Takes N. Y. Territory for Lawrence-McFadden Co.

Mr. T. Bruce Beck, for 15 years a chemist with the Lawrence-McFadden Co. of Philadelphia, Penna., has been made sales representative to cover New York state, nothern Pennsylvania and northern New Jersey. He is a graduate of the University of Pennsylvania.

Mr. Beck takes over the territory formerly covered by Mr. Frederick L. G. Schuessele, Jr., who passed away Oct. 10, 1947. Mr. Schuessele had been with the company for 55 years.

Gehnrich Appoints Smith to Handle Technical Publicity

Gehnrich & Gehnrich, Inc., Woodside, Long Island, N. Y., manufacturers of industrial process ovens and dryers, has appointed Harry W. Smith, Inc., New York City, to handle technical publicity. The program will be based upon field studies of outstanding installations and market research to establish new and extended uses for the special equipment involved.

Thompson & Co. (Paints) Celebrates Centennial

To commemorate its 100th anniversary, Thompson & Co., Oakmont, Penna., has issued a beautiful brochure, picturing its history, production facilities and products.

The organization, specialists in product finishes and protective coatings, had its beginning back in 1847 with the construction in Pittsburgh of the first linseed oil mill west of the Allegheny Mountains.

J. V. Thompson and E. K. Thompson.

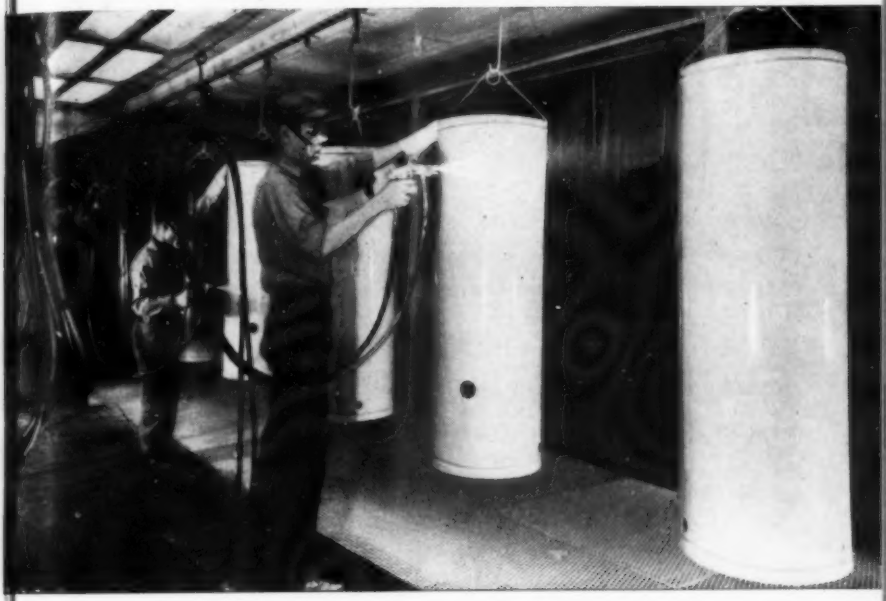
In the past few years, which will also be the future policy, according to the president, Thompson & Co. has concentrated its development and production facilities on product finishes and protective coatings. In the product finishing field, the company has developed and produced a number of coatings for metals and plastics.

To produce protective coatings that meet the individual requirements of each customer and to overcome each specific problem, Thompson paint engineers carefully survey the problem with an on-the-job analysis, followed by careful laboratory testing of the methods of productions and application and of the conditions to which the coating will be exposed.

Officers of the company are:

J. V. Thompson ..... President
D. D. Munroe ..... V. P. & Sales Mgr.
E. K. Thompson ..... Sec. & Adv. Mgr.
J. E. Pyron ..... Treas. & P. A.
A. W. Tritsch ..... Asst. Treas.
G. H. Overholt ..... Asst. Secretary

HIGH HEAT-RESISTANCE



WITH R-M ENAMELS...

A LARGE midwestern manufacturer of oil-burning space heaters, hot water heaters and vehicle heaters (name on request), uses R-M enamels and undercoats practically 100%.

This manufacturer has come to appreciate the value of individualized R-M customer service. For R-M enamels were especially formulated to meet their needs . . . calling for high heat-resistance, toughness, hardness, positive color retention, gloss and a high degree of adhesion and flexibility. More details? Just drop us a line.

R-M

RINSHED-MASON COMPANY 5935 MILFORD AVE. DETROIT 10, MICH.

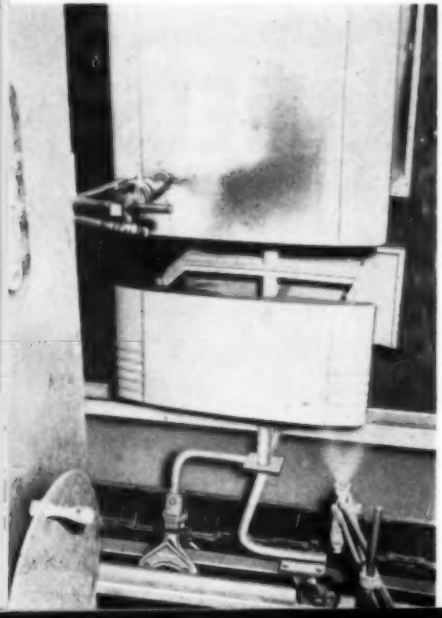
AUTOMATIC FINISHING SET-UP FOR Refrigerator Cabinets

A 6-stage Spra-Bonderite section dry-off oven; automatic painting in water-wash spray booth in an air-conditioned room; finish bake oven and modern chain conveyor system.

PRODUCTION WAS boosted 27% and costs were reduced 43% when Crosley Corporation's refrigerator plant at Richmond, Ind., installed an automatic finishing system. The finishing department now processes 1100 refrigerators in an 8-hour day, with less labor than previous equipment required for 800 boxes. The engineers of an oven company in Minneapolis designed and built this automatic system to operate efficiently and economically in a limited floor space only 25-ft. wide by 450-ft. long.

With floor space at a premium, the oven engineers had to make use of all available space up to the 22-ft. ceiling. Both dryoff and finish bake ovens are mounted overhead, permitting use of the floor space below for other purposes. The dryoff oven is installed directly over the 6-stage Spra-Bonderite section. Floor space below the finish bake oven is taken up by conveyors, storage, etc.

Both ovens are compact, multipass, horizontal type with direct gas-fired, automatic, forced-convection heat. Temperatures are held uniform between 300° and 350° F. Thorough drying for 25 minutes following the phosphate treatment eliminates the extra labor of a blow-off operation. Traveling about 18-ft. a minute, the variable-speed monorail conveyor carries boxes and parts through the



Automatic spray guns, which are mechanically synchronized with a special floor-type conveyor, paint the cabinets completely—all-around.

Easy does it...

WITH

FUSION TYPE FINISHES

Red X Fusion Type Finishes offer you the "magic" of applying successive coats immediately, eliminating costly waiting periods between each application. Expensive heat treating equipment also is no longer required. In these and many other ways Red X Fusion Type Finishes are cutting costs for finishing materials users from coast to coast.

Red X Fusion Type Finishes require no special thinners. Wiping stain, filler stain and paste filler reduce with petroleum naphtha: other Red X materials are ready to use. Application is made in the customary manner. Wiping materials clean up easily and quickly. No gummy or sticky residue. Seal immediately or at any subsequent time. Get the complete story of Red X Fusion Type Finishes. Write to Reliance Varnish Co., 917 E. Kentucky St., Louisville 4, Ky.

Rely on Reliance

RELIANCE VARNISH CO.
INCORPORATED
LOUISVILLE CHICAGO BROOKLYN

Bonderite and up into the dryoff oven, then down again to be transferred to the paint conveyor.

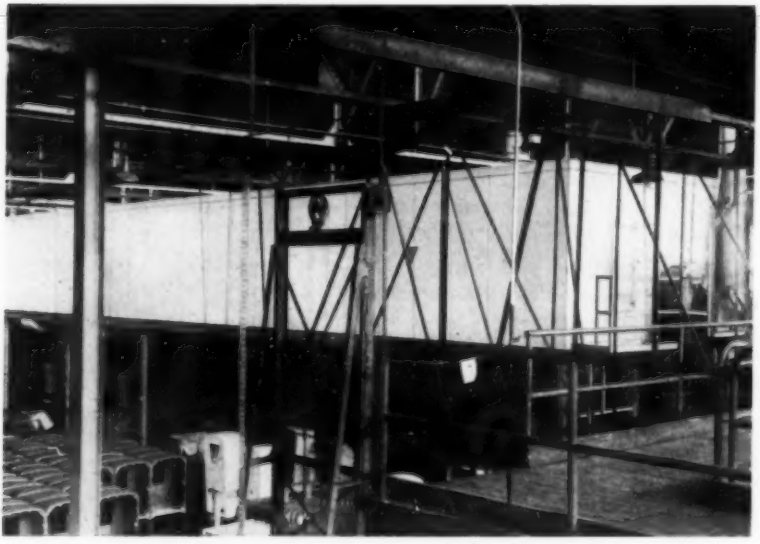
The split conveyor system permits the paint or Bonderite departments to work independently of each other. This holds loss of productive time to a minimum and eliminates complete shutdowns of the whole system.

The automatic painting section for prime and finish coats consists of seven staggered spray booths installed in an enclosure 107-ft. long. This spray room is supplied with heated and filtered make-up air. Glass windows permit observation of the painting process from the outside.

In the enclosure automatic spray guns are mechanically synchronized with the special floor-type (pedestal) conveyor. They paint both sides and top. As the boxes and parts emerge from the spray room, only one touch-up man is needed to put the finishing touches on 137 refrigerators per hour.

From the touch-up station the boxes and parts are carried up into the finish baking oven at approximately 12-ft. per minute by the variable-speed paint conveyor. They are baked uniformly and thoroughly for 47 minutes as they make four horizontal passes through an oven 22-ft. wide, 136-ft. long and 11-ft. 10-in. high. From dryoff the work descends to floor level again for inspection, unloading and transfer to the assembly line.

Speed and economy are the main features of Crosley's automatic finishing department which includes conveyor handling, robot painting; and fast, uniform, convection-heat ovens. Limited floor space is used to best advantage with modern efficient planning and engineering.



Ovens are above other production equipment to utilize the limited space effectively.

Tumble FINISHING Toys

By HOWARD FORD
Finishing Foreman, Dowst Mfg. Co.

SELECTION OF a method to use for applying durable and decorative coatings to toys depends upon the type of the toy you have in mind—and its price. There are at least five methods from which to choose—lithograph, dip, spray, tumble and dip-whirl.

Most of you are familiar with the small metal toy "prizes" found in boxes of popcorn. They include all sorts of minature animals, such as dogs, horses, elephants and others; also minature tanks, automobiles and tractors—all in white metal alloy. Obviously production must be large and the cost of manufacture must be held down to a low figure. So far as the application of finish coating is concerned, tumbling seems to meet all of the requirements.

Tilted Tumbling Barrels with Liners and . . .

In the above picture you will notice four tumbling barrels of the same size. Each one has a removable liner equipped with metal fins to aid in tumbling the pieces. There is a liner

for each color. The enamel colors we use include blue, green, brown, black, red, tan, aluminum and gold bronze. All of these colors are suitable for tumble finishing.

The chief reason for using this type of unit is that constant production can be maintained on the tumbling barrels by substituting a different color liner. Another reason is that the task of unloading the machine is speeded up. We simply remove the loaded liner and pour the coated toys into shallow metal trays (see picture) for baking.

For tumble finishing we mix enamel and solvent in equal parts. For aluminum and gold bronze finishes the consistency is about the same as for spray painting. Temperature and humidity play a big part in successful tumble finishing. In extremely hot dry weather the percentage of solvent may be reduced, but when the humidity is high, it is advisable to increase the percentage of solvent used.

Detailed Technique of Our Tumbling Procedure

Our method of tumble finishing is simple. About 2000 of the small white metal toys are placed in the liner which is then put in the tumbling barrel. The barrel revolves at 60-rpm. Depending upon the size of the articles to be coated, from 1-oz. to 4-oz. of material is put into the barrel.

We have found that a long-handled spoon (such as is used in every kitchen) is the most convenient tool to use for putting enamel into the tumbling barrel. For example, about 1-oz. of aluminum satisfactorily coats a barrel of small elephants or horses. Tractors and automobiles will require 2-oz. to 3-oz., and tanks 4-oz. The entire 4-oz. of enamel is not put into the barrel at one time. About 2-oz. is spread over the revolving pieces; then about two minutes later another 2-oz. is added.

After the tilted tumbling barrel has revolved five minutes the liner is removed and the contents are poured into shallow metal trays, as shown in the illustration. These trays are then slid into racks on a castered truck, and the loaded truck is pushed into a batch-type oven for baking at 275° F. for 15 minutes.

It is inadvisable to attempt to apply pastel shades or any dye colors to metal products by tumble finishing, because of the fact that it is impossible to use a sufficiently heavy bodied material. For pastel shades and for the application of clear lacquer to other types of toys, we use a dip-whirl machine. This is a rapid operation.

Full Line of Spray Equipment Offered by M. & E. Mfg. Co.

M & E Mfg. Co., 2571 Winthrop Ave., Indianapolis 5, Ind., is now located in a modern manufacturing and assembly plant which is supplying to the industrial trade a complete line of spray equipment, including standard dry booths, special water wash booths, air compressors, propeller-type motor-driven exhaust units for removal of hazardous fumes; paint circulating systems, oil and water extractors, spray guns, material containers, hose and hose connections, portable spray units, and hot lacquer apparatus.

Connections with a nationally-known steel company assures the firm a plentiful supply of sheet metal.

The company maintains an engineering department wherein new and special equipment is designed to meet the exact requirements of various industries.

Branch offices are maintained in New York, Cleveland, Chicago, Detroit, Cincinnati, Evansville, Ind., and Los Angeles, Calif.

M & E Mfg. Co. was organized in 1913 but for many years it was a small organization. However, recent expansion and added facilities have placed the firm in position to offer its present full line of spray equipment, along with engineering and installation service.

Top men in the organization include R. Egener, President and General Manager; H. G. Pankratz, Chief Engineer; F. L. Whitten, General Sales Manager; and C. E. Andrews, Director of Purchases.

Standard FINISHES for Every Purpose

SINCE 1870

Specialized Production Finishes for

Wood and Metal Furniture
Toys
Office Appliances
Household Appliances
Venetian Blinds
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Insulated Wire and Cable
Impregnating Compounds
Metal Decorating, containers, closures, etc.

Railroad Finishes
All types

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All types

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A complete line of Paints, Varnishes and Enamels

TOCH BROS., INC.
R. I. W. Water-resistant Compounds
Technical Finishes

EXPORT
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Quality Control

Four score years' experience plus the most modern of technical facilities is your insurance of uniform top quality and service in STANDARD Finishes.

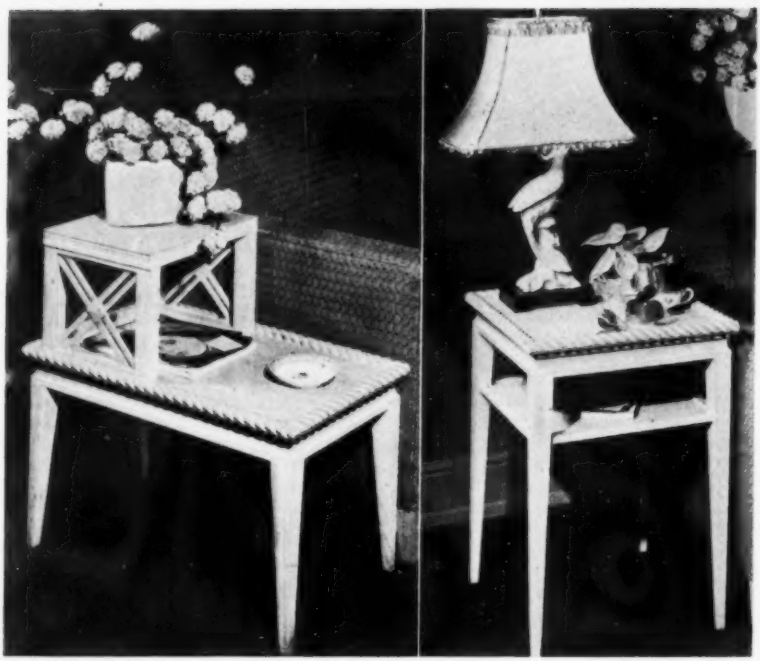
Again and again, STANDARD has developed a formula that meets specific needs far better than anything previously used.

As an independent leader in the industry we invite you to consult us on ANY protective coating problem.

STANDARD VARNISH WORKS

Engineers of Product Finishes

NEW YORK — LINDEN, N. J. — CHICAGO



Finishing Oak Tables

Some problems that were solved in applying a modern limed oak lacquer finish on mixed red and white oak modern tables.

By JOSEPH HALPERIN

ONE CHICAGO manufacturer producing a modern oak group has met and solved some finishing problems which, for a time, presented serious difficulties. This group of tables was made similar to the limed oak furniture of a generation ago—which again goes to prove that there is nothing new under the sun.

Oak is one of the more difficult woods to work with. Considerable care must be exercised in handling and processing it so that the stock will come to the finishing room in as nearly perfect condition as possible.

Patching presented quite a problem. Ordinary patching filler showed through the finish; also it would shrink, which caused rejection at final inspection. Two fillers proved their

Remember Pearl Essence for

A Decorative Finish

MEARLMAID Pearl Essence is being used on hundreds of different products to produce a decorative and attractive effect.

Investigate the numerous advantages of a Mearlmaid Finish before you select the final coating. Its sales appeal and merchandising value are important.

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153 WAVERLY PLACE NEW YORK, N. Y.

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MEARLMAID PEARL ESSENCE

Has High Reflective Light Value

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worth here. A urea-resin glue, pressed in with an extremely hot patching knife, acted as a plastic wood filler that matched the color of oak itself; and a water putty eliminated shrinking and the undesirable color imparted by ordinary wood crack filler.

Mixed Red and White Oak Had to Be Uniformed

During present scarcities of lumber stocks, it is difficult to get full carloads of either red oak or white oak. As a result, mixed lumber had to be processed. Where rift sawn or comb grain white oak plywood was specified for tops and shelves, mixed grades of white oak panels were used. These problems naturally had some effect in the finishing department, but thanks to the technological skill of the finishing laboratories, the differences were minimized to where satisfactory uniformity and equality were obtained.

After the tables were assembled, sanded and inspected, they were moved into the finishing department. The first coat was a toning stain which equalized the color in red and white oak. This oak toner was sprayed "straight." About eight gallons were required for 100 tables. Originally this coat was to have been shellac but, due to the high cost and difficulty of obtaining shellac, the toner was used.

Another objection to shellac for this job was that it acted as a sealer and did not permit enough white filler to enter the pores of the wood, although it did facilitate wiping. A drying period of four hours to overnight was allowed before the tables were moved to the next operation.

White Filler Sprayed On; Then Wiped and Hosed with Air

The second coat was a white crack filler. At first it was put on by brush, but this proved to be too slow so spraying was put into effect. Naturally the reduction of this filler to spraying consistency cut down the pigment content of the filler, but it was still heavy enough to give the wood a fairly good brush man could put out about 15 tables an hour. An average sprayer did 40 tables an hour. After spraying, the tables were left to dry for five minutes. This allowed time for complete absorbtion of the material.

The first wiping was done with jute tow. After the white filler was wiped with tow, the work was passed on to another wiper who used a scrim cloth to wipe off the remaining excess filler.

The rope moulding presented a little difficulty, so after wiping, a stiff brush was used to get the excess filler out from the deep grooves in the twists. The last operation was inspection. The inspector used an air hose to blow out all filler that evaded the wiping operations.

Lacquer Sealing; Sanding; Top Coats

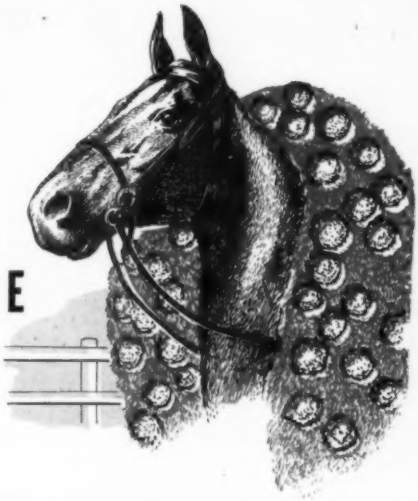
The next operation consisted of spraying lacquer sealer. A regular "21% solids" sealer was sprayed "straight." This coat was given half an hour for drying. Then the tables were sanded with a No. 6/0 silicon carbide sandpaper.

After the sealer coat was sanded the tables were sprayed with a "27% solids" clear gloss lacquer. Two coats were sprayed over each other to complete the spray work.

A drying period of three hours was allowed, after which the tables were steelwooled with No. 2/0 steel wool. A complete wiping with regular furniture polish finished the job.

Pedigree

MAKES A DIFFERENCE



Winners become famous when they win consistently — products become famous when they ***satisfy . . . consistently!***

Thus, the fame of Pedigree Finishes is the result of giving years of satisfactory service . . . because they are specifically developed to meet the most difficult and exacting service requirements.

Pedigree Technicians have worked out thousands of finishes to solve problems ranging from coating hair-thin wire with enamel that won't chip off when the wire is flexed — to finishing massive machines in minutes as they move down the production line.

Your particular finishing problem may be equally complex . . . consult our research technicians — they'll be glad to help. Just write . . . there's no obligation.

The

P·D·GEORGE CO·

5200 N. SECOND STREET • ST. LOUIS 7, MISSOURI

Dip Finishing Play Pens

Would you be good enough to send us tear sheets, if available, covering the finishing or dipping of play pens? After giving this item considerable thought, we feel that a good deal of trouble is going to be encountered. Side sections are 27½x 40-in. Production on this item will start soon, making 1000 per week.—X. Wood Products.

We are sending you tear sheets of an article which may give you some of the information you desire. This is about the nearest thing we have to the product you mention. We suggest that you call in an experienced finishing engineer or service man.—ED.

Wiping Rag Service

We are searching for someone operating a cloth rag wiping service and are wondering if you could help us. We have looked through your magazine but do not find any advertisements, but perhaps from time to time you have had ads or references which are in your file. We would like to find a standard rag wiping service along the lines of weekly or bi-weekly pick-up service, whereby they could take the dirty rags back for cleaning and leave clean rags for the week or weeks following.

The rags are for general cleaning and wiping in our finishing department. I am quite sure you will understand our requirements. If you have the names of people who are supplying a service of this kind, we would like to have their names and addresses so we can get in touch with them, mentioning your firm as a source of contact.—H. Mfg. Co. (2 Rivers, Wisc.)

We do not know the name or address of any concern that supplies the cleaning service for wiping rags which you mention, although we feel sure that there is a servie of this kind in every large industrial city. Perhaps there is such a service in Milwaukee, although we are not sure about it. Can some reader help us on this?—ED.

Liquid Masking Material

We are in need of some liquid rubber, to be used for masking, or some other liquid material suitable for masking plaster statuary, and are wondering if you could advise us of a source of supply. At present we are using paper masking tape which is unsatisfactory.—R. Art. Co.

Try Minnesota Mining & Mfg. Co., St. Paul 6, Minn., or Cleavland Laboratories & Mfg. Co., Newark, N. J.—ED.

Who Makes "Duroseal?"

We are trying to find out who manufactures a sealing material which goes under the trade name of "Duroseal." Can you advise us who makes or sells this product?—W.S.

We don't find this exact name in the N. P. V. & L. A. Trade Mark Directory. Can someone tell us about it?—ED.

Viscosity Cup Wanted

Kindly send us the name of the manufacturer who makes a "Viscosity Cup" for checking the viscosity of lacquers.—G. & T.

In every issue, for the past several months, Ford Viscosity Cups have been advertised in the classified section of this magazine by The Vol-U-Meter Co., Buffalo 16, N. Y.—ED.

Toy Enamels

We would appreciate your sending us the names of manufacturers of safe enamels for toys.—T.E.Co.

In a letter we are listing several of them.—ED.

Whirl Finish Machines

Could you refer me to some manufacturers of whirl finish machines? Our problem is one of painting small parts for repair sales.—A-C. Mfg. Co.

Try Ronci Machine Co., 2 Atlantic Blvd., Centredale 11, R.I.—ED.

Technical Consultant Wanted

Could you recommend a technical consultant, with extensive background in processing and finishing, to review our

Dependability plus-

YARNALL
INDUSTRIAL FINISHES

have that PLUS factor because —in the making it's a "must" with Yarnall that provision be made for accomplishing *more* than minimum requirements. They never fail *because*, they have—*"Something to spare."*

lacquer and enamel finishes? Despite frequent efforts to reduce them, certain of our finishing costs will appear excessive. We believe a fresh viewpoint expressed in a comprehensive report might point out possible approaches which we have neglected. We wish to supplement the service given by different paint manufacturers, with the impartial decision of a trained consultant.—C.R.Co.

In a letter we are submitting names and addresses of a few men who might serve you.—ED.

Redistilling Lacquer Solvents

In the past we have seen advertisements of concerns here on the East Coast that specialize in redistilling lacquer solvents and thinners. The concerns we have in mind, we believe, are located in Connecticut or New Jersey. Would it be possible for you to supply us with their names and addresses?—H.F.

The only one we know of, at the moment, is Solvents Recovery Service, 1019 Broad St., Newark 2, N.J.—ED.

Painting Plastics

We have a letter from a friend suggesting that we write you for information concerning the use and application of silk screen paints on plastics. We use methylmethacrylate and vinylite principally, and at present writing know very little about the silk-screen process. However, we must know some way to effectively color designs on a clear background.

He thought perhaps you had printed an article on the subject and that you might have some reprints available.—A.P.I.

We are pleased to refer you to an expert on painting plastics, Mr. John F. Daymude, Chemical Engineer, whose feature article on this subject appears in Aug. 1947 issue of th's magazine, beginning on page 54. Also, we are enclosing tear sheets of some articles that may be of interest to you.—ED.

Ovens to Dry Enamel on Castings

On page 100 of the October issue of I.F. we observe that some company is inquiring into the use of infra-red ovens for drying synthetic enamel on grey iron castings.

We would appreciate the opportunity of corresponding with the manufacturer, as we have had a great deal of experience in drying synthetic enamels on castings of this type. If you will refer to page 12 of our catalog, you will observe a photograph of the installation made at the Double A Products Co., Manchester, Mich. This company manufactures woodworking and machine lathes for Sears Roebuck Co. and the parts which they process vary in weight from a few ounces to 40 or 50-lbs. The manufacturer inquiring into the use of infra-red ovens would be at liberty to write to the Double A Products Co.—Jensen Specialties, Inc., Detroit, Mich.

Ink Sticks to Glass

I understand there is a new ink that you can write on glass with, and it will not wash off. Can you give me any information on this?—U.I.

We suggest that you communicate with the Stewart Research Laboratory, P. O. Box 173, Washington 4, D. C.—ED.

Can Supply Glass Beads

In October issue of I.F. we note, in your "Letters from Readers," (page 98) that a concern is looking for glass beads for outdoor signs. We are selling considerable quantities of this material to concerns who make outdoor signs, bulletins, etc., and if you will refer our name to A.P. Co., or let us have their name and address we will contact them regarding their requirements.—Edward C. Ballou Co., New York 13, N. Y.

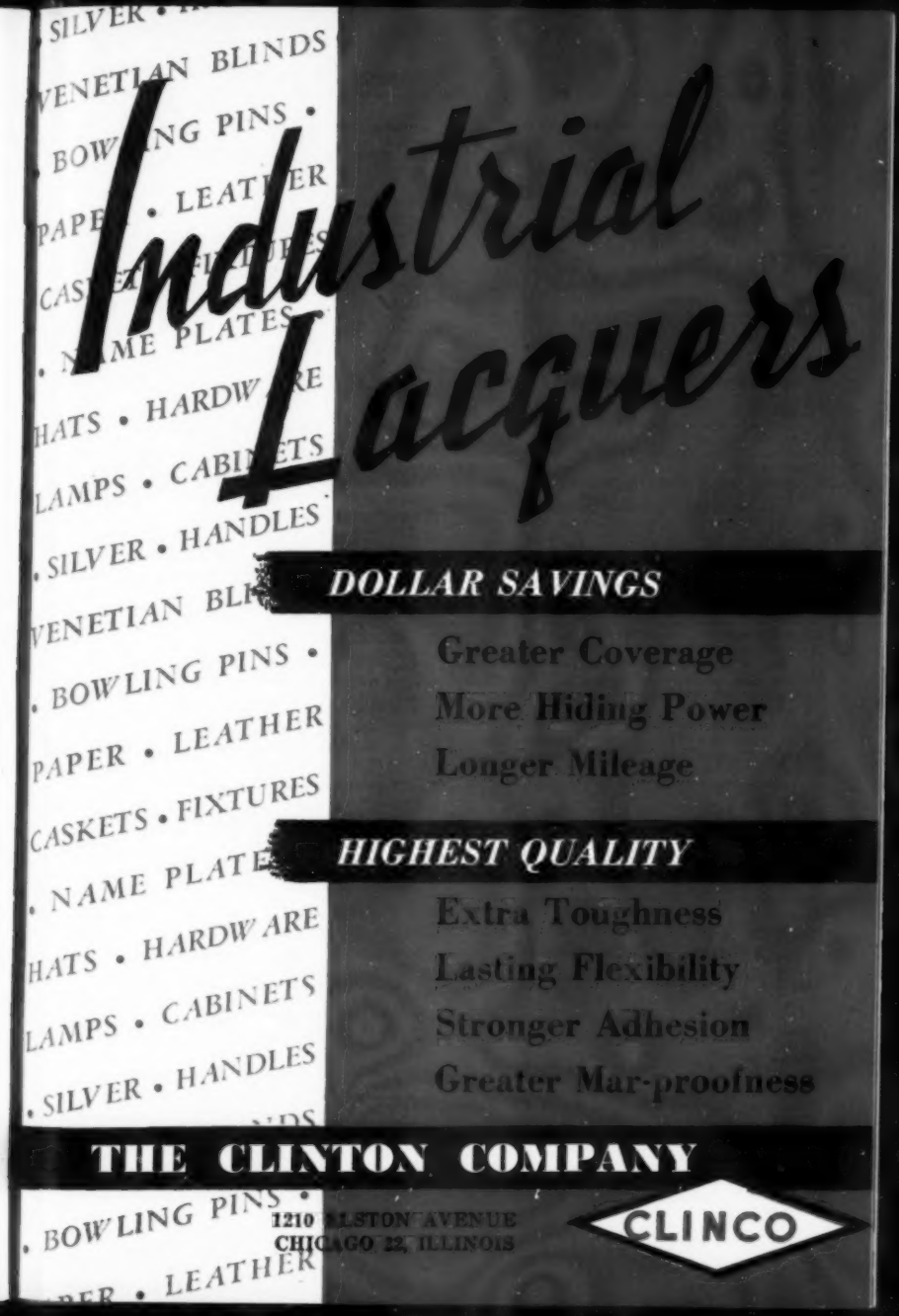
On page 98 of October 1947 issue, there is an inquiry from A. P. Co. for glass beads to be used on metal signs. We have 275-lbs. of glass beads like the samples which we are sending you with this letter. Please pass this information on to the people who are inquiring for them, and ask them to contact us if they are interested. Prior to the war, we were in the metal sign business and used many thousand pounds of these beads with success.—C. E. Erickson Co., Inc., Des Moines, Ia.

Art of Picture Framing

We refer to your Sept. issue, Letters from Readers, the article, "Art of Picture Framing." If your correspondent, in his last paragraph, refers to the art of hand crafting he is only partially correct, because there are small shops throughout the country who create their own designs and finishes in frames.

I have in mind particularly a number of factories who make a business of producing picture frames, as well as mirror frames, of a high quality both in design and finish. You might call these frames hand-crafted because virtually all the operations are done by hand and do not have what you might call a commercialized or routine appearance.

While the number of older craftsmen are diminishing these factories are constantly training some of their younger men into this type of work. Of course, the present trends for simpler and more colorful interiors has created a demand for pictures and frames to harmonize.


SILVER •
VENETIAN BLINDS
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PAPER • LEATHER
CASKETS • FIXTURES
• NAME PLATES
HATS • HARDWARE
LAMPS • CABINETS
• SILVER • HANDLES
Industrial Lacquers
DOLLAR SAVINGS
Greater Coverage
More Hiding Power
Longer Mileage
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Lasting Flexibility
Stronger Adhesion
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and this, no doubt, represents the vast majority of frames that are manufactured today.—Vilas-Mages Co.

Detecting Glue Spots Before Finishing

We have read with interest the article, "Detecting Glue Spots Before Finishing" by Frank Stover (Oct. issue, page 48) and would like to know who is the manufacturer of the material known as "Neon-X", as well as all pertinent data as to the use of this material.—M.Co.

In the October 1947 issue of I.F. there is an article, beginning on page 48, in regard to trouble in the finishing room because of glue spots. This article describes trouble along this line which we are continually experiencing and we are therefore interested in trying out the process described as "The Detection of Vagrant Adhesives."

Can you furnish us with information as to where we must purchase this "Neon-X", and can you also give us particulars in regard to the near-violet ray lamp which must be used in this process? We note the article states that it must not be a violet ray lamp, but only a near-violet ray, and as this is rather ambiguous we would like to know just what the lamp specification should be.—G.R.S.

For further information, get in touch with Grand Rapids Varnish Corp., Grand Rapids, Mich.—ED.

Designs Flock Coating Machines

In the September 1947 INDUSTRIAL FINISHING, I noticed there were two companies interested in securing flock coating machines. I have designed such equipment. Please furnish me with the names and addresses of the S.P.&W.Co., and A. N&S.—John H. Mason, 1216 Industrial Trust Bldg., Providence, R. I.

Striping Tools Wanted

Is there a pencil striper on the market? What we have in mind is something like an ink fountain pen where you can put the paint in and move it around and stripe.—C. & H.

In the September 1947 issue of this magazine, page 100, I read an article on the mechanical striper which is of great interest to me. May we have the names and addresses of several firms that are making striping tools in order to locate this special striper distributor?—N. T. Co.

As distributors of industrial finishing equipment and paints, we wish to locate a manufacturer of striping tools for the motor car industry. We would be grateful if you could supply us with a list of manufacturers whom we could contact.—C. V. & E. (Belfast, Ireland).

We suggest you try the following:
Paasche Airbrush Co. .....Chicago 14, Ill.
K. H. Gettner Shop .....Detroit 4, Mich.
Beugler Mfg. Co. ....Los Angeles 4, Calif.

Engineer to Design New Finishing Setup

For some months we have been considering establishing a finishing department in our plant. We are now interested in locating some firms who engineer and install complete finishing systems. It will probably be a small installation. The work will be nearly all black wrinkle on steel and zinc alloy die castings.—S.V.E.

In a letter we are suggesting the names of a few engineers who might be interested in your proposition.—ED.

"Phenoplast" Coats Plastics

Many thanks for the very nice story you ran in your October issue on "Phenoplast". Your readers must follow your book religiously, judging by the surprising number of inquiries we received as a result of this article.

In your correspondence column we notice reference to an article on painting phenolic plastics, which appeared in your August issue. This happens to be one of the outstanding uses of "Phenoplast", as any phenolic molded piece can be dipped in our material and come out with a non-porous, non-absorbent coating having a higher gloss than any amount of buffing could produce—and it is all phenolic and completely bonded.—Lockrey Plastic Products Co.

To Coat Bobby Pins

We manufacture approximately 12,000-lbs. of bobby pins per month and we require a good method of finishing these pins in enamel, colors black and brown. We do not have an assembly line automatic spraying method available, and we are seeking the next best method.

We prefer a local company (Brooklyn, N.Y.) for convenience of shipping and time element. All tumbling and some centrifugal operators we have had experience with so far, have been disappointing. We would be very grateful, if you could recommend someone to us.—B.M. Mfg. Co.

Color Blind Man Okay As Spray Operator

By Elton Sterrett

SOMETHING over two years ago I happened to be in the "hiring and firing" office of a friendly competitor "up north," when the personnel man asked if I'd care to sit in on the screening of an applicant for a spray booth job. I sat. The department had all the gadgets which go to give a scientific appraisal of a man's aptitude for the type of work he seeks; jigsaw puzzles, Chinese chamfered block assemblies, peg-and-board units, and a set of Ishiwara chromatic cards for color perception.

The candidate came through each test in fine shape, until the color cards were brought out. There his failure was pitiful — although I may have been to some degree conditioned to my sympathetic reaction by his discharge button and the empty left sleeve of his jacket. When the personnel man positively turned down the man's plea for a trial anyway, I impulsively pulled out a card, shoved it across to the applicant and said: "I believe we could place you—if you'd care to go that far south (Texas). Just show my card to Mr. Bedell, our finishing foreman, and tell him how we met. If you make good we'll refund your traveling expense."

The man probably never will succeed to Bedell's job, because of his inability to match colors on a custom job, but his excellent spray gun work has resulted in our securing several long runs of finishing where our quality was enough better than some competitors to bring home the bacon, even against slight price differentials. Although the man cannot distinguish colors he has, to an unusually high degree, that perception of shading which, so opthalmologists have told me, often is Nature's compensation for the inability to differentiate individual hues. It was my recollection of this peculiarity of the color-blind which prompted me to make the job offer, and which resulted in our securing a top quality man with the spray gun.

Since hiring that veteran, we have picked up two other color-blind men for spray booth jobs, and have found them well above average in their ability to apply an even coating—that smooth uniform finish which must appear on the product of a commercial finishing plant if it is to exist in the face of present competition.

V. J. Dolan Adds New Men and Plant Facilities

V. J. Dolan & Co., Inc., Chicago, Ill., announces the addition of two important men ot the organization—and some added plant facilities.

Norman H. Jasmer, identified with the industry for 20 years, and for the past eight years Chicago manager for a well known manufacturer of finishing materials, will handle technical sales in all of Dolan's metal finishing lines.

Otto H. Giese, a production and service man with 30 years experience, will supplement the present staff in serving customers in both metal and wood finishing lines.

Additional plant facilities recently added include the installation of four underground storage tanks and a pump house, giving 50,000 gallons of additional storage capacity, along with better facilities for handling solvents and thinners for finishing materials.

Mr. Wm. V. Dolan, now Vice President of the company, was in the service of his country for four years during the late World War II.

A. J. Heberer Becomes President of Indianapolis Varnish Co.

The Indianapolis Varnish Co., Inc. announces the association of Albert J. Heberer in the capacity of President of the firm. Mr. Heberer will be in charge of all sales and production work.

The Indianapolis Varnish Co. is a subsidiary of the Perfection Paint & Color Co. of Indianapolis, and has been in business continually for over 75 years.

Mr. Heberer, for the past six years, has been vice president in charge of research and production for a varnish company in Louisville, Ky. Before that time he was associated with a finish manufacturer in Cleveland, Ohio.

How to Measure Lacquer Used — to Get its Cost

We notice on page 104 of Sept. 1947 I. F. that the L. N. Co. wishes to measure the flow of small quantities of lacquer for cost purposes, and that they are unable to secure a meter for this purpose.

We have found that the most accurate way of measuring small quantities of lacquer is by means of a suitable scale. Although lacquer is purchased by the gallon, the temperature at which it was originally measured at the plant of the supplier is usually not the same temperature at which it is used, so even if an accurate meter could be secured, the results would not give high accuracy for cost purposes.

A drum of lacquer should be carefully weighed upon arrival at the plant, and the net weight noted. Given the number of gallons on the invoice and the cost per gallon, it is an easy matter to calculate the cost per pound of your lacquer.

At the spray booth a drum of lacquer can be placed on the scale and attached to a spray gun. After each piece of furniture is sprayed, the amount of lacquer used can be determined by noting the difference in weight.

We are sending the Editor a circular from the Howe Scale Co. (Rutland, Vt.) for a scale which weighs up to 125-lbs. and it may be read to 1-oz. Since 1-oz. is about 1/128 of a gallon, this will give the desired accuracy.—Rway, Inc. (Research Development Dept.).

May we make a belated comment on the request for a meter to measure lacquer flow, made on page 104 of the Sept. 1947 issue of this journal?

The person making the inquiry was evidently not a practical man or he would not be seeking a meter to measure lacquer flow, in view of the inherent difficulties encountered in even piping this material.

If his need for accuracy is really down to the degree he states, our suggestion would be that he place his drum on a platform weighing machine and, from the difference in weight before and after spraying, calculate the volume of material used. By using a dial scale and a watch he could also compute, very simply, his consumption for any given time.—H. R. WALTERS PTY. LTD., Sydney N.S. W., Australia.

Finishing Teak Wood

We would appreciate receiving suggestions and recommendations for the finishing of teakwood veneered panels. Due to the natural oil of the wood, it has been common practice to shellac and wax the surface. When a lacquered finish is preferred, what solvent should be used to extract all of the oil, so as to insure a permanent bond for the lacquer?—T.W.S.

Teak is one of the romantic woods from the East Indies. From early times it has been favored for sea chests, decking, etc., where its great hardness, strength, and durability

Where is the wisdom in hiding a good product under a poor finish?

PRATT & LAMBERT-INC.
Industrial Finishes
NEW YORK BUFFALO CHICAGO
FORT ERIE, ONT.

served well. As is the case with many other woods from the tropics, the durability of teak is due in part to the large amount of oil it contains. This oil, however, creates special problems in gluing and finishing.

Before finishing teakwood, the oil should be removed from the surface by washing with toluol, lacquer thinner, or VM&P naphtha. Some finishing craftsmen say alcohol is better for the purpose. However, lacquer thinner is being used successfully in at least one case. It is safe to assume that any of the solvents just named is satisfactory.

Since the teak is being used in veneer form, consideration should be given to removing the oil before laying it up into panels. This will simplify the gluing as well as the finishing problem. The oil can be removed from the veneer by steeping it in a tank of solvent, then allowing it to dry. After moisture conditioning, the veneer can then be laid up into panels, and no washing will be required before finishing.

The natural oil in teak will soften up most varnishes and many lacquers, just as will the oil in Tennessee red cedar. For this reason the preferred topcoat, in the past, has been shellac, followed by waxing. However, oil-resistant lacquers and urea-alkyd furniture finishes are also all right.

Teak is sometimes filled, and sometimes not, depending upon the wood structure and the effects desired. Better adhesion of the topcoat is obtained if it is not filled. Dye-type stains, if any stains are used, are preferred because they interfere least with adhesion. Water stains do not take very well on teak because of its oily nature. The non-graining-raising stains are satisfactory. Everything considered, washing teak with solvent to remove the surface oil will enable the finisher to avoid trouble if he chooses the right topcoats.—R. H. WAMPLER.

More About Teakwood

Our experience with the finishing of teakwood—other than with shellac or wax—has been limited; and in all cases of recollection, it has been possible to dip the wood and thus get a maximum extraction of its oil near the surface. Our experience has demonstrated that either toluol or xylol is the best solvent medium.

Strangely enough, we have never encountered teakwood veneered panels. But as the teakwood flitch would undoubtedly be comparatively thin—probably not more than a 20th of an inch thick—I believe that a thorough saturation and wiping of the surface with these solvents might extract sufficient oil to make a lacquer finish practical.

As a further aid, it might be well to spray, as a first or sealing coat, a very thin application of a mixture of shellac and what is known in the trade as "Waterproof Mixing." This latter is of nitrocellulose base and, when mixed with shellac, imparts toughness to it, so that you have the desirable sealing properties of shellac, plus a receptive foundation for lacquer top coats.—PAUL KENNEDY (Interchemical).

Trouble in Finishing Cast Metals

Most of our finishes are baked synthetic enamel, and on large pieces —aluminum and cast iron mostly. Any defects, such as dust pimples or blisters, on the final coat often necessitate doing the piece over, since the dulness resulting from touching-up by rubbing compounds (our present method) creates too great a contrast to the high luster of the baked finish. Is there any polishing agent on the market which would restore this

If it pleases the eye—it's half sold! And merchandise sells itself when it's finished **right!** Finished right means UNITED Finish, for UNITED Lacquers flow free, dry fast, hard and tough.

UNITED High Speed Lacquers have been **tried, tested** and **proved** superior by manufacturers. In gloss, satin or dull finishes they're absolutely uniform in quality and performance. Every standard formulation is **time** tested for durability.

What's YOUR Problem?

Send your requirements to us. We'll find the **right** finish and send you a generous working sample. No obligation, of course.

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high luster, or is there a method of touching up which would remove pimples without destroying the original gloss?

We have used water, gasoline, and naphtha, as sanding lubricants with Tri-M-Ite paper. Although water is an effective agent, it seems to give rise to air and gas blisters, so now we resort to the other mentioned agents in lieu of water. These do not seem to cut as well. Could you mention adequate substitutes?

The putty we use to fill deep holes and pits has to be baked first before it can be made hard enough for sanding. This necessitates an additional operation. Lacquer putty is unsatisfactory, except for very small holes, since baking will cause it to raise and blister. Is there a putty available which will dry in air, harden sufficiently to sand, and not be affected by subsequent baking operations?—S.C.

Synthetic enamels are always difficult to touch-up in a satisfactory maner. It is usually simpler to lightly sand the entire piece, rub out the blemishes, and re-coat. However, if the blemish is small or if it is located in an area that isn't too prominent, the following method may be employed:

Cut a hole slightly larger than the defect, in a piece of masking tape. Put this over the area, placing it so that the defect is exposed by the hole. Use No. 4/0 steelwool twisted around the end of a blunt stick to rub down the defect. Th n carefully shield the remainder of the article from any mist and spray a light but wet coat of thin color on the exposed spot. Remove the mask and bake. To avoid objectionable color variation, keep the baking temperature as low as possible.

Sometimes it is easier to repair small areas with an artist's brush rather than to use a spray gun, thus avoiding the need of masking. Although synthetics can be rubbed and polished, I know of no polish that will restore the original high gloss. Small parts, however, can be buffed.

Repairs are always a costly procedure, and every effort should be made to avoid the need of making them. Blisters are caused by air or moisture trapped beneath the surface. Filling holes or grinding out suspicious spots before painting will remove some potential sources of trouble. Deep holes in aluminum castings are best filled with aluminum solder. Some putties, made for use under baking enamel, will air-dry for sanding.

Assuming that the work is properly clean and dry, try pre-heating it before applying the first coat; then spray while it is slightly warm. Following the water-sanding operation, flush every trace of "mud" from the casting and see that it is made thoroughly dry. If oven space is not available for pre-heating or drying, a few infra-red lamps, set up in proper position, wil do the job. Watch out for water or oil in the compressed air lines.

The presence of dust in the air is often a spray room problem. This dust must be traced to its origin. Wipe each casting with a tack-rag just before spraying the final coat, and make sure that the enamel you are spraying has been stained. Clean floors and clean booths will help, but all sweeping should be done at the end of the day, so that the dust will have settled long before morning. Wetting the floors will help. If the work does not go directly into the oven after its final spray coat, be sure that it is protected from dust-bearing drafts.

Ovens that have a forced circulation sometimes deposit dust on the enamel while it is still tacky. If it is possible to turn off the circulation fan for a few minutes when a load enters the hot oven, try it. This will allow the enamel to harden a bit and be-

Better

RANDOLPH FINISHES

through Research

Research has always been regarded as the most important single function of the Randolph Organization. Great care has been exercised in assembling a staff of expert technicians and large sums of money invested in the finest modern laboratory equipment and facilities.

This policy has made it possible to constantly improve established Randolph products and to develop many new scientifically correct finishes for special and exacting requirements.

The soundness of this policy is proved by the ever increasing demand for Randolph finishes which required a 25% increase in our plant facilities last year and a further increase of 25% which is now being planned.

We invite you to submit your special and difficult finishing problems to us.

DOPES • LACQUERS • ENAMELS

RANDOLPH PRODUCTS COMPANY

Carlstadt New Jersey

come dust-free before the fan is started. Lastly, make the cleaning of ovens, trucks and racks a regular ritual.—GEORGE CONRAD.

I have never found a way to overcome defects on high-luster finishes on metal, particularly baked finishes. There are too many things to cause such blemishes—and aluminum and cast iron are especially susceptible to them.

All aluminum castings, as well as cast iron, that I have had to finish were full of little fine pits or holes which filled up with impurities (cutting compounds, dirt and grease) in the machining process. Then, during the baking process, these impurities would come out, forming blemishes. We never could polish them out. Our trend has been away from high-luster finishes. We don't use them at all; haven't used a high luster finish since the first World War. Regarding a putty for deep holes, we have a putty that air dries over night. We use it for all putty work on our product. The procedure is putty today, sand tomorrow. It stands baking, but not a long high-heat bake. It sands nicely. I have baked it in various degrees, such as 200° F. for three hours or 350° F. for half an hour with good results, under a lacquer finish. The lacquer, of course, does not need baking. This putty is our own make. We mix and grind it in our own mills, using our own formula.—P.W.K.

For spot patching on sheet metal or castings, we use two methods and they both work well. Using the lacquer method, we first wet sand the area to be patched; then finish off with a few strokes of fine paper, dry sanding. Next we apply a wet coat of primer surfacer at low pressure, and let dry. After this is thoroughly dry, we knife on a coat of pyroxlyn putty to build up the surface. When the putty is dry we proceed to wet sand and then give the surface a dry sanding with fine sandpaper.

Wipe with a tack rag and apply the lacquer coats, usually two or three at low pressure. As the lacquer starts to dry, spray a wet coat of thinner over the entire patch. This will flow it out and also dissolve the dust and make it much easier to rub out.

The next operation is to take No. 400 wet or dry sandpaper and water, and give the entire area a light wet sanding. Then follow with a rub down of Duco No. 2 compound. This, if rubbed properly, should give a high luster and a clean patch.

The other method we use is to proceed as previously mentioned—to sand the patch area, especially where there is a surface hole or dent. Then, if the area is not rough, roughen it some with a putty knife or metal scratcher, down into the metal. Then

Appropriate
Today — more than ever — your product requires an appropriate finish. A coating which will catch the interest and motivate a purchasing desire in the prospective customer.
In this respect, we are equipped to assist you. The competent artists in our Creative Studio are thoroughly -experienced in preparing finishes with individuality . . . they tailor the finish to fit the job.
Do not hesitate to contact us when your finishing problem gets the best of you. We're specialists in this type of work . . . it is our aim to give you *exactly* what you want. Take advantage of our service and give your product greater sales appeal through a better finish.

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Manufacturers of Protective and Decorative Coatings

knife into the spot a coat of Econite paste. This will adhere to bare metal and it depends on the depth of the hole, how long it will take to dry. It can be warmed up with an infra-red spot bank which will dry it faster. After drying well it can be sanded dry or wet. Then a coat of synthetic primer is applied.

After the primer air dries 15 or 20 minutes, follow with the enamel coat. A double coat is better. Then bake out with a small bank of infra-red lights. After baking, the patch can be wet sanded with No. 400 sandpaper and rubbed down with Duco No. 2. However, if the color is white or a light color, the patch will bleed slightly. In using the Econite paste on light color jobs, you can finish out with pyroxylin primer and lacquer and get good results—HOWARD DEAN.

To Finish Cherry

We are interested in finding out what finishing technique to use to finish furniture or cabinet work made of cherry wood.—W. R.

First, of course, the wood surfaces must be sanded smooth. Now make a sponging solution consisting of 1 lb. of dextrine and 2½ gallons of water. Sponge the wood thoroughly with this mixture. Let it dry and sand smooth with No. 6/0 sandpaper. This sanding operation should be done carefully. Avoid sanding too deep. If your sanding reaches below the surface of the dextrine mixture, the grain will again raise. The wood will become very smooth if it is sanded properly.

Spray on a coat of rich red cherry non-grain-raising stain. Let the stained surface dry for about one hour. Then spray on a coat of rich brown walnut filler mixed to a thin consistency. This coat is more for color than for filling, since not much filling is required on cherry wood. Let this filler set up for a few minutes. Then wipe the surface clean and clear.

Let filler dry thoroughly and spray on a thin coat of lacquer sanding sealer. Sand this coat ligthly after it is dry, to clean the surface of lint, nibs of filler, etc. Then spray on two coats of sanding sealer. Let dry and sand to a smooth surface with No. 6/0 sandpaper. Clean up the surface with tack rags, and spray on two good coats of rubbing and polishing lacquer for wood. After this is dry, wet-sand the surfaces with No. 400 wet-or-dry sandpaper, and poiish with a sheepskin buffer and polishing compound. —FLOYD H. COHAGAN.

I have no doubt that the system of finishing just given will produce a beautiful rich color and smooth full appearance. The dextrine sizing is good treatment for cherry. However, I am afraid that the finish will be lacking in toughness and scratch-resistance. As an alternate system—to eliminate this possibility without sacrificing the rich color—I would suggest the following:

Make sure the wood is well sanded, and size with dextrine as suggested. Sand the surface and apply the non-grain-raising stain. Now, instead of following with filler, spray on a rich brown wiping stain or pigment wiping glaze. Allow this coating to set a few minutes and wipe clean. This stain will produce the same richness as the filler, and at the same time it will fill any tiny pores that remain open.

When the stained surface is dry, follow with a thin coat of lacquer sealer. Sand the surface dry. Then apply a full coat of lacquer. Allow the lacquer to dry six or eight hours or overnight. Then wet-sand to a very smooth surface with No. 400 wet-or-dry sandpaper and clean up

Speedy Finishing Operations

Wonderful things may be achieved in very little time. In the wood-working industry that's especially true where

RAPIDRY FILLER

is used to speed-up production in large furniture factories. Rapidry Filler is especially designed for reducing time on the production line. For example — manufacturers of RADIO CABINETS find Rapidry Filler invaluable in peak season — find it entirely satisfactory in all particulars — and it drys to the finishing point within a half hour. Where speed is essential — together with faultless finish — we recommend Rapidry Filler. We still manufacture the conventional type of over-night filler — as well as the 4 hour filler — but Rapidry is our latest triumph — production-proven — durable.

Our 40 year old reputation is your assurance of satisfaction.

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THE GILBERT SPRUANCE CO.

RICHMOND AND TIOGA STREETS
Philadelphia 34, Pa.

with tack rags. Follow with two more full coats of the same lacquer. Then wet-sand and polish as directed.—ROLLIN H. WAMPLER.

Random Comment on the Industrial Scene

(Continued from page 11)

in any language, indicating evidently that the company will go after export business, especially south of the U.S.

* * *

Practical Education. Professor William B. Cornell, chairman of New York University's School of Commerce, Accounts and Finance, announces a time-study laboratory, fitted with modern equipment and appliances, motion picture apparatus and other facilities for studying work simplification techniques in industrial plants and offices. The laboratory will be used in conjunction with a new course "Techniques of Time and Motion Study and Work Simplification." The course is being offered this year.

* * *

Aluminum Canopies and Awnings have made their appearance recently. Canopies may be used for all outside doors. One size being offered is 46-in. wide, 36½-in. deep and 21½-in. high at the wall, finished in baked enamel.

Awnings are offered in stock sizes with red, green and orange stripes. The stripes are in two widths with bright aluminum showing between. Stripes are put on with a mechanical striper.

* * *

Dangerous Dust. Dust accumulates in most industrial plants, especially those of wood construction. Even in modern plants, air and exhaust ducts, pipes, fan and heater housings are favorable areas for dust collection. Accumulated dust may become a fire or health hazard, maybe both.

Apparently industry has recognized the danger, perhaps partly through some persuasion by insurance companies, or just sound industrial sense, for it is said that sales of industrial vacuum cleaners are up more than 300% above pre-war levels. Regardless of the reason, cleanliness pays.

New England Sales Branch Opened by Interchemical

The Finishes Division of Interchemical Corporation, announces the establishment of a New England sales branch for the company's industrial finishes, with offices located at 10 N. Main St., West Hartford,

R. K. Hungerford, New England Sales Manager for Finishes Division of Interchemical Corp.

Conn. This new branch will operate under the direction of Robert K. Hungerford as New England Sales Manager, with five veteran representatives serving customers throughout the northeastern states.

Mr. Hungerford has spent 22 years in the industrial finishes field and began his career with Roxalin Flexible Finishes, now a part of Interchemical Corporation, in 1925 as a salesman in the state of Connecticut. His hobby is particularly suitable to industrial finishing since he is a model railroader who has built many working models of old-time locomotives and is a member of the Hartford and New Haven, Connecticut, and Westfield, New Jersey Model Railroad Clubs.

Mr. Hungerford's sales force includes the following well-known industrial finishes salesmen, whose individual experience in the field averages well over 18 years: Stanley S. Raymond, Richard A. Engel, Henry E. Bauer, Richard J. Franz, William H. Robinson.

The armadillo has an original solution for his coating problem. He's the only mammal who wears his skeleton on his back.

When your surface coating problem calls for an original answer, use lacquer. It's durable as the armadillo's shell, easy to apply, attractive, and tough. Lacquer dries fast, requires no costly drying equipment. Your lacquer supplier would like to tell you about it in more detail.

He Wears His Inside Outside!

COMMERCIAL SOLVENTS *Corporation*
17 East 42nd Street, New York 17, N.Y.

CSC makes solvents and plasticizers, but is not a lacquer manufacturer.

Glossy Durable Finish for Wood and Metal

Lacquer speed of drying plus the fullness of Synthetic Enamel in one coat, is the claim of the Hilo Varnish Corporation, Brooklyn, N. Y., for a coating called "Clix." It has good gloss and resists fruit acids, vinegar, grease, alkali and mineral spirits. "Clix" dries to handle in five to ten minutes and hard enough to pack in from one to two hours. "Clix," available in white and colors, is well suited for use on both wood and metal.

High-Bake "Duranite-H" Resistant to Almost Everything

A new synthetic production finish, named "Duranite-H", capable of creating a coating of hitherto unknown hardness, flexibility, chip resistance, ease of handling, and economy, is announced by the Zapon Division of the Atlas Powder Co., Stamford, Conn.

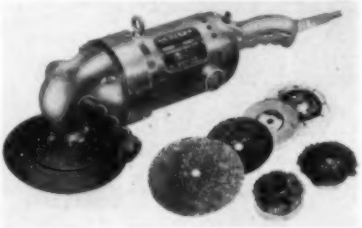
Tests to date reveal that this new Zapon surface coating, which is not formulated from any old line synthetics such as alkyd, urea, formaldehyde, vinyl, melamine, or phenolic, cures extremely full and lustrous. It has remarkable resistance to soap, has humidity resistance, salt spray resistance, hardness, acid resistance, grease resistance and heat resistance.

This new finish is generally applied by spray, and has a baking schedule of ½ hour at 420° F. Such procedure has proved to be especially satisfactory as a one coat operation over bonderized aluminum. By varying the formula it can also be applied by roller coating and printing. It can be pigmented where the necessary coloring materials can stand the high bake.

"Duranite-H" is an especially good finish for dishwashing machines, sinks, stoves, hardware, and other articles requiring the toughest and most resistant finish.

Portable Disc Sanders

Holt Whirlwind Spinners (Holt Mfg. Co., Newark, N. J. and Oakland Calif.) are handy tools for sanding, grinding, burnishing, polishing, buffing and wire brushing. They come



For cleaning and smoothing surfaces before painting.

in two sizes—No. 222, medium duty and No. 223 heavy duty. They are adaptable for use with either 7-in. or 9-in. special Flexholt reinforced sanding disc pads.

These portable machines feature typical Holt design and construction. Side handle is detachable to permit

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Our Field Representatives
New Period field men are well trained and have a good background of practical experience in production finishing. They have a splendid record of service to manufacturers of all kinds of products who have been faced with difficult finishing problems.
You are invited to call on our field men to help you with your production finishing problems, no obligation, of course. It may save you time, money and costly delays.
The complete New Period line includes sealers, gloss, semi-gloss, clear and pigmented lacquers. They are formulated for various methods of application and for any production setup.
A production sample will convince you of its superiority.
Our complete line of New Period finishes and our laboratory facilities are at your service. Write us!
NEW
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ESTABLISHED 1917
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109 IMLAY STREET BROOKLYN, N. Y.

either left or right handed operation. Rugged, cut gears, give long life and stamina. Thumb operated switch. Weight, 14-lbs.; length, not including pads, 18-in. No load speed, 4,500-r.p.m. Both models come equipped with 25-ft. of 3-wire cable with plug. A sanding disc wrench is also included. A suspension ring is provided to help reduce fatigue on long jobs. Model No. 222 is powered with ½-h.p. universal motor. Model No. 223 has a ¾-h.p. universal motor.

Variable-Speed Compact Tumbling Barrel

Designed with streamlined appearance, the new "Murco" tumbling barrel, announced by D. J. Murray Mfg. Co., Wausau, Wis., has special features of interest to manufacturers that deburr, burnish, clean, polish and smooth-surface metal and plastic parts on a mass production basis. Compact, the "Murco" tumbling barrel is simply designed for low maintenance. Speed changes may be made while the barrel is in motion, giving a wide range of speeds to meet various operating conditions and requirements.

Tumbling barrel has many new features.

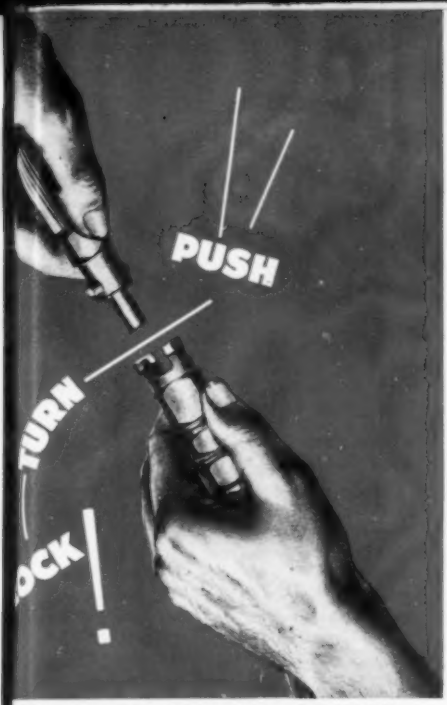
Specially designed dump pans are mounted on casters, and are provided with bail handle notched for crane hook. The discharge end of pan is funnel shaped, which fits in the compartment opening to facilitate loading. Separating screens of various mesh wire can be mounted in frames to fit dump pans. All moving parts such as the barrel, gears, pulleys and motor, are protected with guard rail, steel enclosures, and concealed design for safety of operation. While the frame and barrel are light weight they are designed and built to withstand heavy duty service.

Corrosion-Resistant "Finish No. 146"

The Mitchell-Bradford Chemical Co., 3446 Main St., Stratford P. O., Bridgeport, Conn., announces a new product, "Finish No. 146", which can be used as a clear corrosion-resistant finish on steel or as a tenacious bond for subsequent application of paints, lacquers and enamels over steel, aluminum, zinc-base alloys, copper alloys and magnesium. It can be either air dried or baked. Can be furnished clear or tinted, and is applied by dipping, spraying or brushing.

When "Finish No. 146" is used as a bond or undercoat, the coating can be applied either by dipping or spraying, and air dried. Enamels and lacquers can then be applied over the No. 146 and if the lacquers and enamels are of the baking type, the No. 146 will withstand any of the normal baking temperatures of these coatings.

Sample 1½x3-in. aluminum panels are available to which "Finish No. 146" has been applied over the entire surface, and on one side a coating of synthetic enamel has been sprayed



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SOLVE THE EXACTING FINISHING
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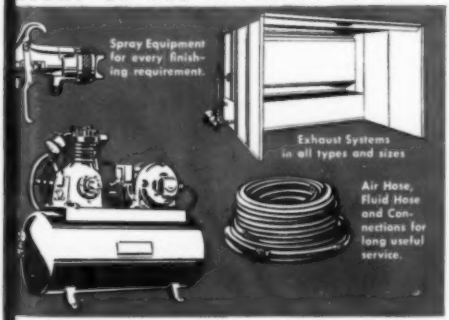

Spray Equipment for every finishing requirement.
Exhaust Systems in all types and sizes
Air Hose, Fluid Hose and Connections for long useful service.

ns Quality *in all four* . .

RAY EQUIPMENT
XHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS

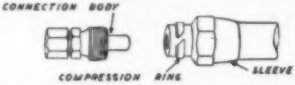
DEVILBISS HINTS . . . on *Finer Finishing*

HOSE CONNECTIONS ARE *BIG* DETAILS

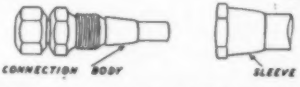
No link in the chain of spraying equipment is so small that it can afford to be neglected. Efficient operation means more than merely connecting hoses. It is a costly mistake to overlook the genuine value of this seemingly little detail.

Some operators try to get by, using wires and improvised clamps to couple hose. This is false economy and a poor substitute, for makeshift couplings may snag the hands and cut the hose itself besides permitting leaks which quickly inflate air costs. Good connections hold the whole spray line tightly together. They should require no special tool and little time and effort to couple. They should be leak-proof and last the life of the hose and still be reusable on new hose.

Hose connections are generally either the Compression Ring Type or the Expander Screw Type. In the Compression Type an



extension of the connection is inserted into the hose body and the compression ring clinches the hose as the tapered collar is screwed onto the connection body. Because of ease of coupling hose with the compression ring connector, this type is preferred in most all cases.



In the Expander Type, a tapered stem is thrust into the hose body. The collar is then drawn up to the connection pulling the hose tightly up on the tapered stem. In order to attach this connection, it should be put in a vise so as to exert enough force to push the stem far enough into the hose body to allow the collar to grip the threads of the connection.

Bending hose double to shut off the air is most destructive. A Quick Detachable Connection prevents this destructive practice since an automatic valve closes off the air flow when the coupling is disconnected. No need to run to shut off the whole air line nor to kink the hose.

By quickly plugging in such a connection with a simple twist, the air-tight connection is assured. Switching from one tool to another with a single air line is a moment's work. No need to clutter the shop with a tangle of duplicate hoses. No wrench is necessary, and the wear and tear so common to threaded connections is entirely eliminated.

FINISH SET-UP FOR A VARIETY OF *Metal Products*

THE WARNER MFG. CO. plant in Glendale, Calif., manufactures a variety of metal products for Pacific Coast customers. Its finishing department receives a large portion of incoming work from the die-casting department—usually after the parts have been routed through certain operations in the machine shop. The die castings are made of aluminum alloy, magnesium, zinc and manganese bronze, in various shapes, plain and intricate, large and small.

Aluminum Alloy Bodies of Haylo Gas Heaters

To get an idea of what goes on in the finishing room, let us follow the aluminum body of a Haylo gas heater. The aluminum alloy body is formed in a die-casting machine; several machine operations follow. All "flash" is trimmed from the louvers by a special machine. Surfaces are sanded on belt sanders, and some work is performed at the burring and filing benches to further smooth down rough spots inside and outside. Spot puttying is applied where necessary to give a perfectly smooth surface for the paint coating.

The bodies are put into galvanized wire baskets—two to a basket—which hang on a conveyor that moves through a degreaser. Baskets of work move through the degreaser at the rate of 360 an hour. The conveyor travels 6-ft. a minute. As cleaned products arrive at the unloading station they are taken from the baskets and moved by trucks to a storage bank close to the spray booths.

Pressurized Spray Room Has Two Conveyor Lines

The pressurized spray room is 65-ft. long, 17½-ft. wide and 8-ft. high. Heater bodies move through the spray booths on a belt conveyor. They rest directly on galvanized iron trays which ride on a thick 14-in. belt which travels along the center of small steel rollers mounted on 3-in. centers. The roller line is 30-in. wide and 31-in. above the floor. Next to the loading area there is a 5-ft. water wash spray booth; then a 2-ft. space and another spray booth. Both spray booths face the conveyor line but they are

★

By FRED M. BURT

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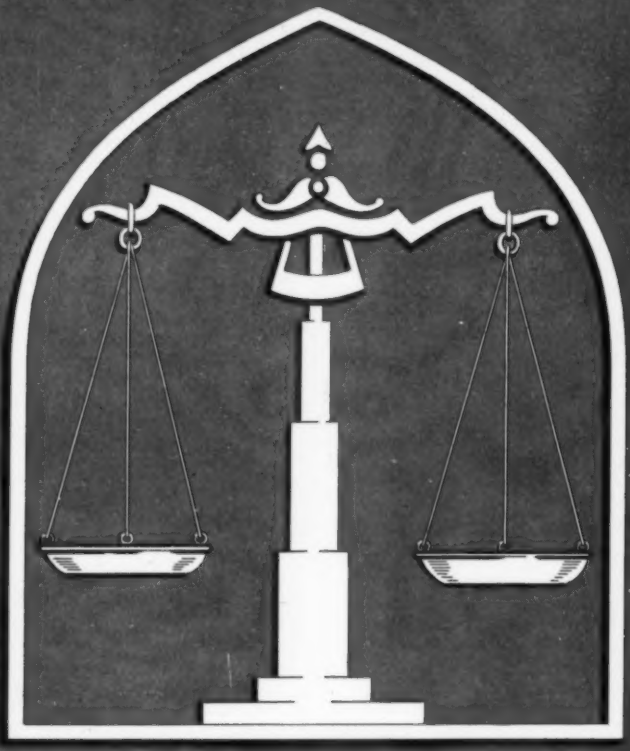
Following a few die cast metal parts through production areas which are set up to smooth and clean metal surfaces; spray on durable decorative finishes in a conveyorized spray room; and to dry the paint coatings in a preheating zone and infra oven.



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Enamels - Stains - Fillers

RESINS & GRINDING LIQUIDS
"Syntex" Alkyds - Special Resins
Varnishes - Grinding Liquids

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and baked over the No. 146. These panels can be bent back and forth without chipping or flaking of the coating until the final endpoint is reached, resulting in the breaking of the panel.

If this finish is to be used as a corrosion-resistant coating on steel, it can be either air dried or baked. However, for the best resistance to alkalies, organic solvents, or acids, it is recommended that the coating be baked at 250° to 300° F. If the coating is to be used for protection during storage, either the clear or tinted types can be used. The tinted types are recommended where future identification of the products is required.

Flexible Hand Sander

A new type of sander and polisher, called the Detro Super-Flex, made of flexible rubber, is being manufactured by the Detro Mfg. & Sales Co., Inc. of Los Angeles, Calif., manufacturers of Detroit Handy "Tac" rags.

The manufacturer claims that the saving in abrasive materials, and time gained by using this new tool, cuts costs up to 50%. The block takes exactly one-third of a standard size sheet of abrasive paper—the entire surface being utilized without any waste.

Makes hand sanding easier, safer, faster.

This new sander and polisher is so flexible that it follows any surface contour. The special construction, with heel rest and handle at the back, and finger pocket at the front, eliminates strain and hand fatigue. All of the energy exerted by the user is transmitted to the block. The finger pocket at the front is an excellent safety feature, since it protects against cuts and bruises.

At the same time the block is thin and flexible enough to give sensitive "feel of the work" for fine sanding. Since the abrasive paper is held securely in place by strong springs, any motion can be used in sanding—straight, side, or rotary.

New Adhesive Sticks to Anything

A synthetic resin-latex emulsion cement has ben produced by Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill., which has the ability to permanently adhere ungummed paper labels to a wide variety of surfaces and surface finishes. Designated as No. 1707 by the makers, it is being offered for fastening instruction labels, circuit diagrams, caution and brand labels to electrolytic tin plate, terne plate, varnished, lacquered, painted and enameled surfaces.

This new adhesive is also suitable for many combining and laminating operations on similar and dissimilar materials, such as cork to metal, felt to cardboard, paper to glass, ceramics, many plastics and other applications. Typical field uses include labeling of refrigerators, household appliances,

Hello...

Here's Another Fine Product Finished with Egyptian

Stromberg-Carlson is a stickler for quality in finish as well as in everything else.

So the fact that they rely upon Egyptian for the base of their 1243 telephone is significant to every manufacturer with whom finish is a factor.

Whatever your finish requirements, you can rely on Egyptian.

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SPECIALIZED PRODUCTION FINISHES

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radio chassis, tin cans, lacquered pails and drums, over printed areas of folding cartons and displays.

It is claimed that paper labels, when pasted on painted test panels with this adhesive, maintain good adherence to the specified surface when aged at 225° F. for seven days and when exposed for 100 hours at 100% relative humidity at 100° F. After air drying, it produces no objectionable odor when the panel is sealed in as airtight container at 100° F. for 24 hours. Furthermore, no harmful effects are observed on the specific surfaces, such as permanent staining, etching or softening and no discoloration of the paper label is noticed. The adhesive can be reduced with water or used as received.

CMD Air Separators

The Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill., announces the new Model "E" Air Separator for delivering clean, dry steam, gas and air. There are no moving parts—no screens, filters, felt or wool. No adjustments or regulations are necessary.

CMD Model "E" Separators are strictly mechanical in operation and require no attention whatsoever other than draining off condensation that accumulates in the chamber. Noncorrosive metals are used throughout the separator. The Model "E" has a maximum rated capacity of 250-CFM. The company also manufactures three other models for lower-rated operating capacities.

Pre-Cure Finish For Rubber Products

A new pre-cure wax finish for molded, extruded or calendered rubber products is announced by Johnson's Wax Co., Racine, Wis. Known as Johnson's No. 3037 Pre-Cure Finish, it not only prevents sticking during storage of pre-cured stock, but serves as a mold release as well. There is no mold "build-up" through carbonizing; the wax finish also eliminates a final cleaning operation. Wax permeates the surface of finished products, giving a smooth satin finish that is really dry. Being water-dispersed, the wax may be applied without fire hazard. No expensive application equipment is required, as the wax may be applied by conventional spray, dip or flow-coat methods.

Scroll-Aire Oven Heater

The Scroll-Aire oven heater for paint drying ovens, moisture drying ovens and industrial processing ovens is announced by the Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich. The Scroll-Aire is a direct gas-fired heater which mixes the products of combustion directly into the air stream. Both the main and pilot burners are approved enclosed pressure type using low pressure combustion air. There is no open flame in the production department and positive control is provided.

Due to its high combustion efficiency and simplified heating principle, the Scroll-Aire reduces fuel costs materially. To further increase this efficiency, the entire fan and heater unit is enclosed in a steel casing with tightly packed insulation throughout.

This scroll type heater is a packaged heating system within itself and thus eliminates the handling of the many component parts normally assembled in the field. This permits a factory test of the unit prior to shipment and thus guarantees immediate satisfactory performance on the job.

The Scroll-Aire oven heater is par-

Fuzzy "Lamb's Wool" Surface
simulated by sprayed on
CLAREMONT FLOCK

Used decoratively on packages, bottles, displays, etc., or as protective finishes and insulation on industrial products,
CLAREMONT FLOCK
offers many advantages!

"Lambkin" toy manufactured by Wakouwa Toy Corp., 585 Washington St., N. Y., N. Y. . . flocking accomplished by G. I. Flocking, 124 W. 21st St., N. Y., N. Y.

We can recommend many flocking specialists who will be glad to work with you and for you. Complete details, color cards and samples furnished on request. Inquiries invited!

CLAREMONT WASTE MFG. CO.
NEW HAMPSHIRE
The Country's Largest Manufacturer of Flock

ticularly adaptable for "rejuvenating" old ovens with inadequate temperature ranges, insufficient capacity or inadequate heat distribution systems. It is easily adapted to ovens of any design and because of its compact construction, it readily fits into the space formerly occupied by the old heating system with room to spare.

Electric ignition, push-button starting and stopping, modulating temperature controls, and many more advanced features are incorporated in this new heater.

Metal Cleaning Machine

A new machine has been developed by the Mabor Co. of Clark Township, Rahway, N. J., for the processing of light, small, cup-shaped stampings of comparatively uniform depth.

Cycles of the equipment include a washing stage, rinsing stage and a section wherein the parts are dried. The hold-down conveyor can be adjusted to accommodate various types of parts, so that high, continuous production can be achieved.

The machine illustrated here is gas heated by means of immersion combustion burners, although any heating method can be utilized. Any one of the three processing stages can be eliminated or additional processing stages may be added in order to bring parts nearer the point where they can be used for assembly.

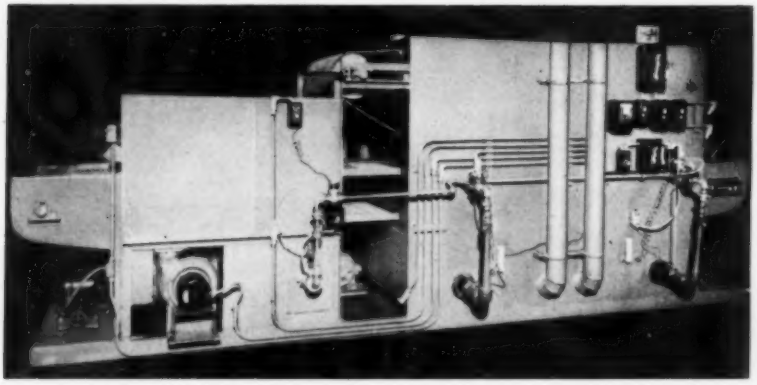
Pumps are close-coupled, and the air heat device is direct fired, although indirect firing may be substituted, if required.

In order to insure maximum safety in the operation of the equipment, it is equipped fully with automatic safety devices for gas burners and temperature controls.

40-Gallon Fire Fighter

A new 40-gallon foam fire-extinguishing engine is announced by Walter Kidde and Co., Inc., Belleville, N. J. Capable of greater foam output with automatic mixing controls, the new unit is a small fire department.

Discharging 450 gallons of fire-killing foam, the unit will smother both Class A fires (involving ordinary combustible materials) and Class B fires (flammable liquids). A unique



A complete machine for washing, rinsing and drying metal parts to be painted.

Highlights on

HILO

Product Finishes

NU-SYNTOL

Low Temperature, Quick Baking, Synthetic White Enamel

Hilo NU-SYNTOL—the new low-heat, short-bake, 100% Synthetic White Enamel—gives more production with the same oven capacity, saves operation costs! Baked at only 250° F. for 10 minutes, NU-SYNTOL provides a smooth, full, high-gloss white finish that resembles porcelain. For products that are expected to withstand a lot of hard wear and usage, baking at 300° F. affords the maximum degree of toughness.

NU-SYNTOL has good outside durability. It resists the action of alkalies, gasoline, mineral spirits, machine oil, grease, liquor, cosmetics, hair tonic and fruit juices.

NU-SYNTOL may be applied by spraying or dipping.

Send for trial lot of NU-SYNTOL for test in your plant.

HILO

HILO VARNISH CORPORATION

42-60 Stewart Avenue, Brooklyn 6, N. Y.

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metering control mixes solutions in measured quantities, which increases substantially the output of the engine.

Mounted on 50-in. wheels with 2½-in. steel tires, the extinguisher can be moved rapidly and easily. The hose rack carries 50-ft. of 1¼-in. coupled chemical hose with a shut-off discharge nozzle, which gives the operator a wide radius of action. Both indoor and outdoor models are available.

Rubber Processed Material Separators

Woven wire screen and expanded or perforated metal in all mesh and sizes, completely covered with rubber, is announced as available for material handling purposes by Automotive Rubber Co., Inc., 8637 Epworth Boulevard, Detroit 4, Mich.

Purpose of the screens is primarily to protect by rubber cushion, parts which have been painted or precision finished so they will not become scratched, marred or disfigured by contact with metal surfaces. The mesh separators likewise permit drainage.

Any size separators can be furnished to fit bottoms of tote pans, conveyor baskets or pallets and can be covered with hard, semi-hard or soft natural rubber or synthetic rubber to meet specific conditions encountered.

"Aquagen" Industrial Metal Cleaner

"Aquagen" is a product adapted for the cleaning of metal, plastic and other surfaces previous to finishing. It is used either alone or with a minimum of the weak alkali products, like sodium silicate or trisodium phosphate, in cold or warm water. It is not necessary to use boiling water.

"Aquagen" cleans completely and quickly, wetting the surface and floating the oil material off of the work. When hard water is used it also helps to remove the lime, leaving the surface spot clean. Where drying of metal parts is required, the usual boiling water final rinse can be used with a small amount of Aquagen added. In a number of cases the surface is clean enough to dry without retained heat. Aquagen may also be used as a wetting agent.

This material is a product of The Miami Products & Chemical Co., 520 Lonoke St., Dayton 3, Ohio.

Cause of Dust Flecks on Finished Work

By Elton Sterrett

EVER SINCE BIBLICAL — Old Testament — days, it has been easier to see the mote in the other fellow's eye than to detect the same fault in one's own optics. I was reminded of this not long ago when a former foreman, now a custom finisher, asked for help. His trouble was motes which, according to Mr. Webster, are "small pieces of extraneous matter." Bill was finishing tables for a neighboring furniture factory. His rejects were running so high that he was losing money—and faith in himself—every day.

A careful check showed that the tables returned for refinishing were those finished early in the morning. Practically all of those finished later in the day made the grade. All of the rejects had tiny flecks of dust to mar the smooth finish, although no source of contamination could be located.

The finishing room was a wide one-story sawtooth building, adjacent to a 4-story concrete building of the type designed for light manufacturing operations — this latter serving

as receiving room for the shipment of tables to be finished.

Checking into Bill's troubles for him, all of the usual sources of lint and dust were eliminated, such as workmen's clothes, etc., but still the trouble persisted. Since the early morning work showed the highest percentage of defects, our investigation was made during the morning. It was not until a slide-projector was called in as aid that the trouble was traced down. Using a projector with a high-powered light hooded in, and the lens blocked so that only a thin pencil of light issued, the room was darkened as much as possible. The beam of light was directed above a table just brought from storage. After the air had been purposely contaminated with some fine lint, the trouble was found to be in the difference in temperature between the finishing room and the new work.

When a piece of work came in from storage and was placed in the relatively warm finishing department, the beam of light showed a slow but steady drift of dust particles down toward the cold table top. The pencil of light showed that this rate of downward flow was faster as the spread of temperatures increased; it was reversed when the work became 5° or more warmer than the temperature of the finishing room.

Light anlysis of the dust in the room, to determine when the greatest amount of dust particles might be expected, showed that this condition coincided with the early hours also. When the room in which the tables were stored previous to finishing was heated so that the work came into the department 8° to 10° warmer than the room, the percentage of rejects faded as quickly as the visible motes when the projection light was cut off.

The reason for lessened trouble, as the day wore on, was that warm

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SPRAY BOOTH
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SPRA-KLEEN keeps nozzles, circulating lines and reservoirs free from over-spray sludge.
SPRA-KLEEN is EASY to use . . . no mixing required.
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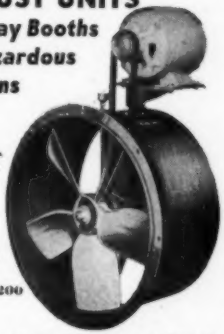
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The Protective Finish with
POSITIVE ADHESION
to really "TOUGH" METALS

Strathmore
METALBOND
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for Spray or Dip Application

Here at last is the formulation with 100% adhesion qualities to the really tough surfaces: lead, brass, copper, aluminum, zinc, galvanize, magnesium and others. Air dries in 15 minutes. Force drying allows film to achieve maximum resistance more quickly. Tried and proven by manufacturers with knotty problems where "something better" had to be found. (Nationally known Quick Freezers, Milk Coolers, Safes, etc.) May be mixed with aluminum bronze for a beautiful silver finish.

IDEAL PROTECTIVE FINISH

Withstands extended immersion in water. Extremely resistant to alkali, dilute acids, soaps, solvents, etc.

Order 5 Gal. TODAY
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Guaranteed Satisfaction at lower cost!

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1970 W. Fayette St.
Syracuse 4, New York

air from the one-story building mixed with that in the colder, concrete unit and thus removed the temperature unbalance which was causing the air currents.

Pressures to Use for Spraying

FOLLOWING is a quotation from a letter received: "The finish on our ____ is rough, the gloss is uneven, and not as glossy as we would like; also, it shows excessive 'orange peel' and pin holes. Our work is too large to use a standard spray booth but we have installed an air supply and exhaust system in the spray room. We are using plenty of pressure on the paint and spray gun—25-lbs. pressure on the lacquer tank and 80-lbs. on the gun...."

A pressure of 25-lbs. on the lacquer is too much. When your spray man shuts off the atomizing air supply and pulls back the trigger of the spray gun, the lacquer will shoot clear across the room. That force must be overcome with excessive atomizing pressure to break up the material.

Excessive atomizing pressure causes: 1) the paint particles to hit the work with greater force; therefore there is more rebound of paint particles which makes excessive overspray or waste; 2) the greater force of compressed air dries out the solvents, and a dryer coat is applied; 3) increase of drying power caused by the high atomizing pressure reduces the temperature of the lacquer film which draws moisture from the air to the lacquer film, causing a blush; 4) the partially dry film doesn't get sufficient time to flow together, therefore an orange peel surface shows up; 5) the excessive overspray settles on the partially wet lacquer film which is too dry to accept the dusty overspray but wet enough to allow the overspray

to stick, and a rough finish is the result.

In order to determine the correct material and atomizing pressure to use, shut off the atomizing air at the pressure gauge. In other words, turn back the pressure gauge control until the gauge registers zero. Hold the nozzle of the gun over a graduate and pull back the trigger, at the same time you start your stop watch. Set the material pressure, which is usually about 5-lbs. on the tank, to deliver the desired amount of material per minute from the nozzle of the spray gun. A material pressure of 5-lbs. will not demand a great deal of atomizing pressure to break up the material.

Turn the pressure gauge control up until a few pounds register, and spray a test panel; examine the test panel, noting the size of the paint particles. Raise the atomizing pressure slowly until the test panel shows a good break-up of the material and a wet, smooth coat with one stroke of the gun. The desired paint film may be obtained at 35 to 45-lbs. It is then advisable to raise the atomizing pressure 5-lbs. more than is needed to overcome temperature changes throughout the day.

As a result of taking these few minutes to carefully check up the spraying pressures, you will get less overspray, a smooth wet coat, good adhesion, no orange peel or pin holes, faster production, and a uniform luster to the finish.—SPRAY ENGINEER.

New One-Coat Hammer Line Announced by Zapon

An improved one-coat hammer line has been completed by the Zapon Division of the Atlas Powder Co., and is now ready for merchandising, according to Don Metz, assistant general sales manager of the firm's Stamford office.

This new product finish, available in bright, cheery colors, can be obtained in quantities of from five gallons to unlimited amounts, ready to spray.

COLOSSUS
WHITE SPANISH
FELT WHEELS
AND BOBS

A SIZE AND SHAPE FOR ALL TYPES OF WORK

64 years of industrial felt production is behind COLOSSUS FELT WHEELS. Individually tested to insure balance, proper density, and quality performance. Obtainable in soft, medium, hard and rock hard densities. Hardness is stamped on each wheel.

Colossus White Spanish Felt Bobs are custom made in a full range of sizes, shapes and densities to suit your production. Ideal for polishing and deburring operations on internal, small and irregular surfaces.

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TRADE MARK

NATIONAL PAINT DICTIONARY

New Edition Ready

$7.50

The long-awaited revision of the National Paint Dictionary is now ready for distribution. This is the third edition by its author, Jeffrey R. Stewart. The size of the book has been reduced to 6x9-in. to meet popular demand, and to facilitate its use in a standard library shelf. The number of pages has been increased from 216 to 704, and a type face has been used which provides maximum legibility.

The terms included in this dictionary may be divided into six categories (though the largest proportion falls into the first two groups) as follows: 1) industrial raw materials used in the production of paints and allied products; 2) trade names of raw materials and certain finished products; 3) terms describing processes, methods, systems, etc.; 4) terms denoting scientific instruments used primarily for evaluation purposes; 5) terms denoting colors, optical effects, textures, etc., and 6) miscellaneous terms which give general information to the reader, jargon expressions peculiar to the industry, etc.

Copies of this new reference book are priced at $7.50 each, cash with order.

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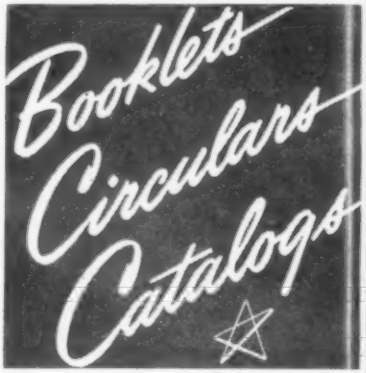

Compressed Air Filter

A new combination air filter and pressure regulator for compressed air supply lines to spray booths is described and illustrated in a circular put out by Trojan Mfg. Co., 2012 N. California Ave., Chicago 47, Ill.

Safety Accessories Catalog

A folder which describes and illustrates safety aprons, sleeves and gloves; safety signs; portable cradles for drums of materials, etc., is announced by Industrial Products Co., 2820 N. 4th St., Philadelphia 33, Penna.

Oven Heater Bulletin

A new bulletin containing complete details of construction and operation of the Scroll-Aire oven heater has been published by the Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich. Concise descriptions, photographs and a cut-away view of the unit completely illustrate the working principle of this new heater.

The Scroll-Aire oven heater is a direct gas-fired heater for use on new or old paint drying ovens and industrial processing ovens. The Scroll-Aire is a complete, packaged scroll-type heating system eliminating the handling of many parts normally assembled in the field.

Measures Gloss of Surfaces

A new photometric unit and exposure heads to measure reflectance, gloss and other features of appearance is announced by the Henry A. Gardner Labo-

ratory, Inc., Apparatus Div'n., 4723 Elm St., Bethesda 14, Md. The apparatus was designed by Richard S. Hunter, formerly of the National Bureau of Standards.

A folder that describes and illustrates the apparatus, and tells how to use it, can be obtained by writing the Henry A. Gardner Laboratory, Inc.

Stainless Steel Paste

Charles Hardy, Inc., 420 Lexington Ave., New York 17, N. Y., announces a stainless steel paste which can be mixed with clear varnish, lacquer or bronzing liquid to produce a bright, durable, corrosion resistant coating for metal. Additional facts about the material can be obtained from the company.

Dust and Fume Eliminator

An attractive 12-page folder, printed in red, green, blue and black, describes and illustrates the principal features of the Schmieg Centri-Merge Swirl Type Dust and Fume Eliminator. A free copy can be obtained by writing Schmieg Industries, Inc., 372 Piquette Ave., Detroit 2, Mich.

Industrial Hygiene Services Available to Industry

Operations involving the use of volatile solvents, unless properly controlled, may expose workers to health hazards. Governmental industrial hygiene agencies in almost every state can assist plant managers in making the solvent department and other potentially hazardous departments safe places to work. The service, available at no cost from these agencies, can be particularly helpful to small plants which have no safety or industrial hygiene departments of their own. Consultation on the department layout, equipment and operation is available from these agencies.

Workmen sometimes develop symptoms of occupational illness when there is no obvious source of trouble in the working environment. In such instances, engineers and physicians from the industrial hygiene service can help to detect and correct the cause.

The Industrial Hygiene Division of the U. S. Public Health Service, which has its headquarters in Washington, D. C., is the national agency responsible for the protection of worker's health. Consultants representing the Division are stationed in Public Health Service District Offices throughout the country. Direct service to industry is rendered by state bureaus of industrial hygiene, which are located in state departments of health except in Massachusetts and New York, where they are part of the Labor Department. A number of cities also have municipal industrial hygiene divisions.

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Industrial FINISHING Editorial

Hightlights of the Metal Exposition

Two members of INDUSTRIAL FINISHING'S staff spent a few hours looking over the National Metal Exposition at the International Amphitheater in Chicago one day last month. Nearly 400 exhibitors were showing products and equipment of interest and value to industrial personnel.

Naturally, our interest centered around equipment for smoothing, cleaning, coating and drying metal products. Many of the exhibits showed actual full-size equipment, all setup and in operation. These exhibits attracted real attention. Machinery in motion, doing useful work, is always fascinating to people.

Everything was clean and operating perfectly, although for general display purposes most of it was purposely slowed down in speed. Even at slow speed operation, one exhibitor gave away several thousand pressed metal ash trays finished in bright colored baked enamel. These were all cleaned, coated and baked in a single conveyorized setup.

Several metal cleaning machines were shown — some small, others large. Various types of abrasive equipment for smoothing and dry cleaning rough castings were in operation. Gas-fired and infra-red ovens for burn-off cleaning, drying washed and rinse surfaces, and for drying paint coatings were demonstrated.

One machine that arrested the attention of most visitors was a combination dip-coating and infra-red drier, wherein small products were placed in the holders on an endless metal band which passed spirally, several times, around two large cyclinders. In this machine the position of freshly dip-coated articles changes as the pieces travel spirally around the drums while the paint coating levels out, sets, dries under heat, and eventually cools to room temperature.

All of what we saw at the Metal Show emphasizes the fact that more and more metal products are being cleaned, painted and dried entirely by machine, leaving production workers only the task of properly placing the products in or on a machine or conveyor, and then removing them after they have been uniformly finished at a continuous steady rate of production.

The tremendous eye-pulling power of a colorful lustrous finish was emphasized in one space where a new Tucker automobile sparkled brilliantly in its shiny coat of red metallescent lacquer, accented by polished chromium plating. It created quite a sensation at the Show.

About Putting in New Spray Booths

When installing one or more spray booths in a finishing room, there are several factors to bear in mind if efficient operation is to be maintained. Among other things what is the size of the room (cubical contents)? Is it in a new building that has tight fitting windows and doors, or in an old building where air leaks through every opening? What is the condition of the room air? Is it clean, or filled with smoke, dust, grease and dirt?

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How much air will be pulled out of the room every minute by the exhaust fans?

These are important things to consider because an adequate supply of clean air is necessary for clean work. If the plant is located in a highly industrialized section where dusty smoke-laden air is all that is available, then air filters will have to be installed. Otherwise the finish will suffer, and rubbing costs will be excessively high.

The size of the spray booth must be considered. It should be large enough to take care of present work and any contemplated future production. It is better to have the booth a little larger than too small to handle a change in the line six months later.

Exhaust fans should be big enough to produce a minimum air velocity of 100-fpm, over the front area of the booth for all materials excepting filler which, due to its excessive weight requires an air velocity of at least 150-fpm. Size and length of the exhaust stack is also important—together with elbows, stack dampers, weather cap, distributor plates or baffles, and anything else that will have a tendency to affect the free passage of air.

There are meters which register the volume and uniformity of air flow. Air flow meters may be obtained from any firm of industrial engineers, or concerns that sell finishing room equipment, or air filter equipment. If the finishing room is comparatively small, and more than one booth is to be installed, the location of the booths should be considered to avoid competition between the exhaust fans for air supply.

Finally, the matter of fire protection is always timely and vital. Only Underwriter's approved equipment, such as motors, fans and lights, should be installed. If the factory has an automatic sprinkler system, sufficient sprinkler heads should be placed along the entrance of the booth to form a

water curtain, and one head should be placed in the exhaust stack just below ceiling level. If an automatic sprinkler system is not available, then fire extinguishers of ample size (and properly maintained) should be placed within easy reach. Prevention is better than insurance.

Is I. Q. a Cue for Selecting Workers?

★ A small plant rarely can afford the services of an expert personnel director—and even more rare is the combination of personnel expert and plant executive who can also handle purchases, production and sales. Likewise, the smaller the plant, the more expensive becomes the hire-and-fire method of securing replacements for, or additions to, the working force. But even the old rule-of-thumb method is apt to prove more workable than an attempt to use the newer plans for selecting employes, especially when such a plan is neither fully understood nor properly followed through.

This condition is illustrated by the experience of a small finishing plant which, born a war-baby for special work, continued on as a peacetime youngster with all its trials, tribulations and growing pains. New men had been selected by a committee of two—the general manager and the foreman of the department needing additional help. But, on an off day, the manager let himself be persuaded ("sold" it a better word) by a Personnel Consultant. This P. C. was a glib talker who knew how to give

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standard tests and determine an applicant's I. Q. It was agreed that applicants should first be screened by the P. C. and, if favorably rated by him, they would be briefly interviewed by the foreman and formally hired by the general manager.

At first, the new plan seemed to be working fine. Men recommended by the P. C. were most of them young, ex-service men, ambitious and with better than average mental powers. Their discharge papers showed noncom or petty officer ratings; they were, almost without exception, high school graduates. But—they just didn't keep up their starting pace. One after another looked for "greener pastures" or asked to be transferred elsewhere in the plant. Each transfer meant that the man would be shifted from a job which he had learned or at least mastered to the point where he no longer represented trainee expense to the company. And with the shift, his loss of production or slowup would cut into the narrow margin which enabled the company to keep going in the face of stiff competition.

Finally, after two especially apt men had laid down their spray guns and walked out with the explanation that they were "fed up", the manager took his troubles to a friendly psychology professor. It developed that the men recommended by the P. C. all had high I. Q. ratings. Few were below 120, none under 105. Here the psychologist put his finger on the trouble.

Work for which the men were selected had been of the repetition type—the same thing over and over, without change. On such tasks, the professor declared, the I. Q. of 120-plus would eventually go crazy. Such jobs were best performed by men having an I. Q. of around 90, as they lacked the imagination which would be wearied by an unchanging routine.

On this basis, files of the P. C. were

checked and several applicants with I. Q.'s of 90-odd were offered jobs. Almost without exception these men, "low-rated" by the P. C., are still in the plant, turning out highly satisfactory work with a minimum of supervision. Yes, their training period was as much as 20% longer than that required by earlier successful applicants, but, these latter men stuck with the job. They are still on the job, happy in their work, and the management is happy with them.

I. Q. ratings, unless expertly applied to a job or industry, can be worse than meaningless. They can cost misplaced employes irreplaceable months, perhaps years, of lost or non-effective effort, as well as slowing production for the company and depriving it of potential eventual foreman material—ELTON STERRETT.

Precleaning Metal, Then Final Cleaning

★ Even a casual observer will admit that efficient metal cleaning, always an important shop problem, is becoming more and more complex in certain industries. This despite the development in recent years of better metal cleaning equipment and improved cleaning solutions.

Two important factors which contribute to more complex cleaning problems are *new metal alloys with peculiar properties* (such as magnesium), and *new forming lubricants and cutting oils* containing a mineral oil base. The occurrence of either factor will quickly short-circuit the efficiency of the old standby, mild alkaline bath and rinse cleaning system.

This does not mean that the mild alkaline bath will have to be discarded, nor that an entirely new cleaning set-up is in order. But it does mean that supplemental cleaning equipment will be required. Here is where a good metal pre-cleaning installation utilizing an emulsifying

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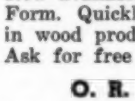
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cleaning action can step into the picture and effect immediate rescue. Such pre-cleaning will remove the mineral-base greases and oils, and will reduce the dirt on metals ordinarily requiring a strong alkaline solution to the point where it can be handled by a mild alkaline bath

The value of a pre-cleaner, under such conditions, is well illustrated by the cleaning setup used by North Aircraft Co. Here aluminum, magnesium and steel are processed through the same mild alkaline bath during final cleaning. The excessively dirty magnesium and steel components, which would ordinarily require a strong alkaline bath, are pre-cleaned by vapor degreasing. When they are subsequently placed in the mild alkaline bath, they clean as quickly and efficiently as aluminum which, under no circumstances, could be processed through a strong alkaline solution.

In fact, more and more finish engineers are beginning to realize that effective pre-cleaning is economical under most conditions. Aside from making it possible to use the same mild alkaline bath for final cleaning of all metals, pre-cleaning will prolong the life of the mild alkaline bath by reducing contamination, and will reduce overall cleaning time by leaving only a minimum of dirt for final removal.

Chances of dirty metal reaching the paint shop are minimized, as the pre-cleaning action reduces initial dirt of different proportions to a level where equal time cycles in the mild bath will effect complete removal. The payoff comes in less cleaning errors, fewer solution changes, and more consistent high quality work.—GILBERT C. CLOSE.

Selection of Finish for New Products

What finish to select for your product? The answer will depend on a number of things, naturally. Selection of the proper coating material to be used for finishing metal products is determined, first of all, by the type of product in question and its use by the ultimate purchaser.

Take, for example, such diversified items as metal furniture, machinery, washing machines, sink cabinets, fluorescent reflectors, frozen food lockers, and shower stalls. Each one calls for a finish to meet certain protective or decorative requirements imposed by the nature of the product as well as the conditions under which it is to be used.

Experience shows that metal products used outdoors should be covered with a highly rust-resistant, non-chalking coating. In addition to affording color permanency and easy washability, it should also withstand the effects of abrasion and general "wear and tear."

Machinery calls for a finish that provides resistance to marring, chipping and scratching. It should take solvent cleaning, striping or varnish decals within a short time after the last coat is applied.

On washing machine bases, the finish must resist soap, alkali and moisture; and provide perfect matching of color with the porcelain enamel tubs. Rust protection and easy cleanability are important features too.

With fluorescent lighting reflectors, the coating should meet these four main requirements: 1) possess a hard surface and high reflectance; 2) retain its original color and brilliance; 3) be easy to clean and remain unaffected by grease and dirt, and 4) prove highly resistant to heat and moisture.

The finish used on frozen food lockers must have high resistance to rust

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and long exposure to moisture. In addition to being hard and scratchproof yet tough and flexible, even after continuous service in sub-freezing temperatures, the finish must be easy to maintain in sanitary condition and it must remain unaffected by food fats and greases.

Shower stalls, like sink cabinets, should be coated with a durable finish that resists soaps and alkalies. It must be a finish that has excellent bonding characteristics.

From these few instances cited, and their finishing material requirements, it is evident that each manufacturer of durable goods has need of coatings specially designed for application on his particular product. Such coatings provide dependable protection and attractive product appearance. Product finishes today are becoming more and more specialized because of the specific merits they provide. That is why their usage is continuing to spread and why more improvements may be confidently looked for in the future. —A. P. SCHULZE.

Modernization Plan Now Completed by Zapon

To meet post war demands for greater production of industrial finishes, the Zapon division of the Atlas Powder Co., with plants at North Chicago, Ill., and Stamford, Conn., has completed a vast modernization plan, according to E. H. Bucy, General Manager of the Division.

New equipment has been added, rebuilding has been done, and key floors arranged so that all tend toward greater productivity with heightened laboratory control. Mr. Bucy pointed out that in order to accomplish this, concrete mezzanines were added so that solvents and resins could be piped directly from storage tanks to production areas by gravity flow.

Additional modern and up-to-the-minute facilities for pigment grinding were also installed, so that now the plant is equipped with late model roll-mills, steel-ball mills, and newest type Berylite mill. These physical factors, coupled with a newly augmented and streamlined "planning department" assure the customers fine workmanship through fine equipment and supervision.